SIEMENS RS324R6

MODEL

SERVICE MANUAL

SIEMENS

HIFI SYSTEM RS324R6

SERVICE MANUAL

INHALTSVERZEICHNIS
TABLE OF CONTENTS

Seite
Page

SICHERHEITSBESTIMMUNGEN / SAFETY STANDARD COMPLIANCE 2

AMP
SPECIFICATIONS 3
BLOCK DIAGRAM 5
SCHEMATIC DIAGRAM 7
WIRING DIAGRAM 9
EXPLODED VIEW 11
I.C. BLOCK DIAGRAM 13
LIST OF I.C. VOLTAGE 17

CD
SPECIFICATIONS 19
LASER SICHERHEITSHINWEISE / LASER SAFETY 20
BLOCK DIAGRAM 21
SCHEMATIC DIAGRAM 23
WIRING DIAGRAM 25
EXPLODED VIEW 27
ADJUSTMENT 30
I.C. BLOCK DIAGRAM 32
LIST OF I.C. VOLTAGE 34

DECK
SPECIFICATIONS 37
BLOCK DIAGRAM 39
SCHEMATIC DIAGRAM 41
WIRING DIAGRAM 43
EXPLODED VIEW 45
ADJUSTMENT 49
I.C. BLOCK DIAGRAM 52
LIST OF I.C. VOLTAGE 54

TUNER
SPECIFICATIONS 57
BLOCK DIAGRAM < FD7311 59
SCHEMATIC DIAGRAM < FD7311 61
WIRING DIAGRAM < FD7311 63
EXPLODED VIEW 65
ADJUSTMENT 67
I.C. BLOCK DIAGRAM (IC1–IC13) 69
LIST OF I.C. VOLTAGE 73
BLOCK DIAGRAM > FD7312 75
SCHEMATIC DIAGRAM > FD7312 77
WIRING DIAGRAM > FD7312 79
I.C. BLOCK DIAGRAM (IC14) > FD7312 81

Ausgabe: 9410
Issue

Änderungen vorbehalten
Subject to modifications

Ident-Nr. 535569

(D) Sicherheitsbestimmungen

Nach Servicearbeiten ist bei Geräten der Schutzklasse II die Messung des Isolationswiderstandes und des Ableitstromes bei eingeschaltetem Gerät nach **VDE 0701 / Teil 200** bzw. der am Aufstellort geltenden Vorschrift, durchzuführen!
Dieses Gerät entspricht der Schutzklasse II, erkennbar durch das Symbol ⧈ .

- **Messen des Isolationswiderstandes nach VDE 0701.**
  Isolationsmesser (U_{Test} = 500 V-) gleichzeitig an beiden Netzpolen und zwischen allen Gehäuse- oder Funktionsteilen (Antenne, Buchsen, Tasten, Zierteilen, Schrauben, usw.) aus Metall oder Metallegierungen anlegen. Fehlerfrei ist das Gerät bei einem:
  $R_{Isol} \geq 2$ MΩ bei U_{Test} = 500 V-
  Meßzeit: ≥ 1 s (Fig. 1)

Anmerkung: Bei Geräten der Schutzklasse II kann durch Entladungswiderstände der Meßwert des Isolationswiderstandes konstruktionsbedingt < 2 MΩ sein. In diesen Fällen ist die Ableitstrommessung maßgebend.

- **Messen des Ableitstromes nach VDE 0701.**
  Ableitstrommesser (U_{Test} =220 V≈) gleichzeitig an beiden Netzpolen und zwischen allen Gehäuse- oder Funktionsteilen (Antenne, Buchsen, Tasten, Zierteilen, Schrauben, usw.) aus Metall oder Metallegierungen anlegen. Fehlerfrei ist das Gerät bei einem:
  $I_{Ableit} \leq 1$ mA bei U_{Test} = 220V ≈ / Meßzeit ≥ 1 s (Fig. 2)
- Wir empfehlen die Messungen mit dem **METRATESTER 3** durchzuführen. (Meßgerät zur Prüfung elektrischer Geräte nach VDE 0701).
  Metrawatt GmbH
  Geschäftsstelle Bayern
  Triebstr. 44
  D 8000 München 50
- Ist die Sicherheit des Gerätes nicht gegeben, weil
  - eine Instandsetzung unmöglich ist,
  - oder der Wunsch des Benützers besteht, die Instandsetzung nicht durchführen zu lassen, so muß dem Betreiber die vom Gerät ausgehende Gefahr schriftlich mitgeteilt werden.

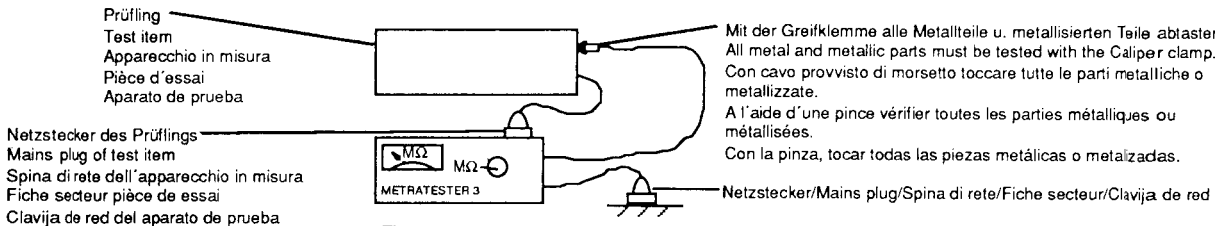

Prüfling
Test item
Apparecchio in misura
Pièce d'essai
Aparato de prueba
Netzstecker des Prüflings
Mains plug of test item
Spina di rete dell'apparecchio in misura
Fiche secteur pièce de essai
Clavija de red del aparato de prueba
MΩ
METRATESTER 3
Mit der Greifklemme alle Metallteile u. metallisierten Teile abtasten.
All metal and metallic parts must be tested with the Caliper clamp.
Con cavo provvisto di morsetto toccare tutte le parti metalliche o metallizzate.
A l'aide d'une pince vérifier toutes les parties métalliques ou métallisées.
Con la pinza, tocar todas las piezas metálicas o metalizadas.
Netzstecker/Mains plug/Spina di rete/Fiche secteur/Clavija de red

Fig. 1

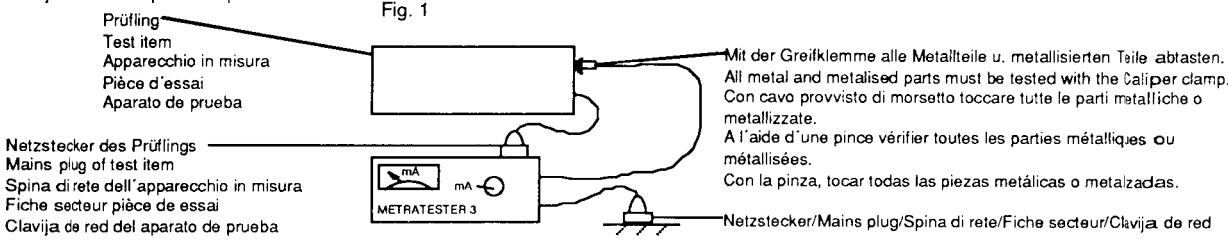

Prüfling
Test item
Apparecchio in misura
Pièce d'essai
Aparato de prueba
Netzstecker des Prüflings
Mains plug of test item
Spina di rete dell'apparecchio in misura
Fiche secteur pièce de essai
Clavija de red del aparato de prueba
mA
METRATESTER 3
Mit der Greifklemme alle Metallteile u. metallisierten Teile abtasten.
All metal and metalised parts must be tested with the Caliper clamp.
Con cavo provvisto di morsetto toccare tutte le parti metalliche o metallizzate.
A l'aide d'une pince vérifier toutes les parties métalliques ou métallisées.
Con la pinza, tocar todas las piezas metálicas o metalizadas.
Netzstecker/Mains plug/Spina di rete/Fiche secteur/Clavija de red

Fig. 2

Empfehlungen für den Servicefall

- Nur Original - Ersatzteile verwenden.
  Bei Bauteilen oder Baugruppen mit der Sicherheitskennzeichnung ⚠ sind Original - Ersatzteile zwingend notwendig.
- Auf Sollwert der Sicherungen achten.
  Zur Sicherheit beitragende Teile des Gerätes dürfen weder beschädigt noch offensichtlich ungeeignet sein.
- Dies gilt besonders für Isolierungen und Isolierteile.
- Netzleitungen und Anschlußleitungen sind auf äußere Mängel vor dem Anschluß zu prüfen. Isolation prüfen!
- Die Funktionssicherheit der Zugentlastung und von Biegeschutz-Tüllen ist zu prüfen.
- Thermisch belastete Lötstellen absaugen und neu löten.
- Belüftungen frei lassen.

(GB) Safety Standard Compliance

After service work on a product conforming to the Safety Class II, the insulating resistance and the leakage current with the product switch on must be checked according to VDE 0701 or to the specification valid at the installation location!
This product conforms to the Safety Class II, as identified by the symbol ⧈ .

- **Measurement of the Insulation Resistance to VDE 0701,**
  Connect an Insulation Meter (U_{Test} = 500 V-) to both mains poles simultaneously and between all cabinet or functional parts (antenna, sockets, buttons, decorative parts, etc.) made from metal or metal alloy. The product is fault free if:
  $R_{Isol} \geq 2$ MΩ at U_{Test} = 500 V-
  Measuring time: ≥ 1s, (Fig. 1)

Comment: On product conforming to the Safety class II the Insulation Resistance can be < 2 MOhm, dependent contructively on discharge resistors. In this cases, the check of the leakage current is significant.

- **Measurement of the Leakage Current to VDE0701.**
  Connect the Leakage Current Meter (U_{Test} = 220V≈) to both mains poles simultaneously and between all cabinet or functional parts (antenna, sockets, buttons, screws, etc.) mad from metal or metal alloy. The product is fault free if:
  $I_{Leak} \leq 1$ mA at U_{Test} = 220 V ≈
  Measuring time: ≥ 1 s, (Fig. 2)
- We recommend that the measurements are carried out using the **METRATESTER 3**. (Test equipment for checking electrical products to VDE 0701).
  Metrawatt GmbH
  Geschäftsstelle Bayern
  Triebstr. 44
  D 8000 München 50
- If the safety of the product is not proved, because
  - a repair and restoration is impossible
  - or the request of the user is that the restoration is not to be carried out, the operator of the product must be warned of the danger by a written warning.

Recommendation for service repairs

- Use only original spare parts.
  With components or assemblies accompanied with the Safety Symbol only original-spare parts are strictly to be used.
- Use only original fuse value.
- Safety compliance, parts of the product must not be visually damaged or unsuitable. This is valid especially for insulators and insulating parts.
- Mains leads and connecting leads should be checked for external damage before connection. Check the insulation!
- The functional safety of the tension relief and bending protection bushes are to be checked:
- Thermally loaded solder pads are to be suck off and re-soldered. Ensure that the ventilation slots are not obstructed.

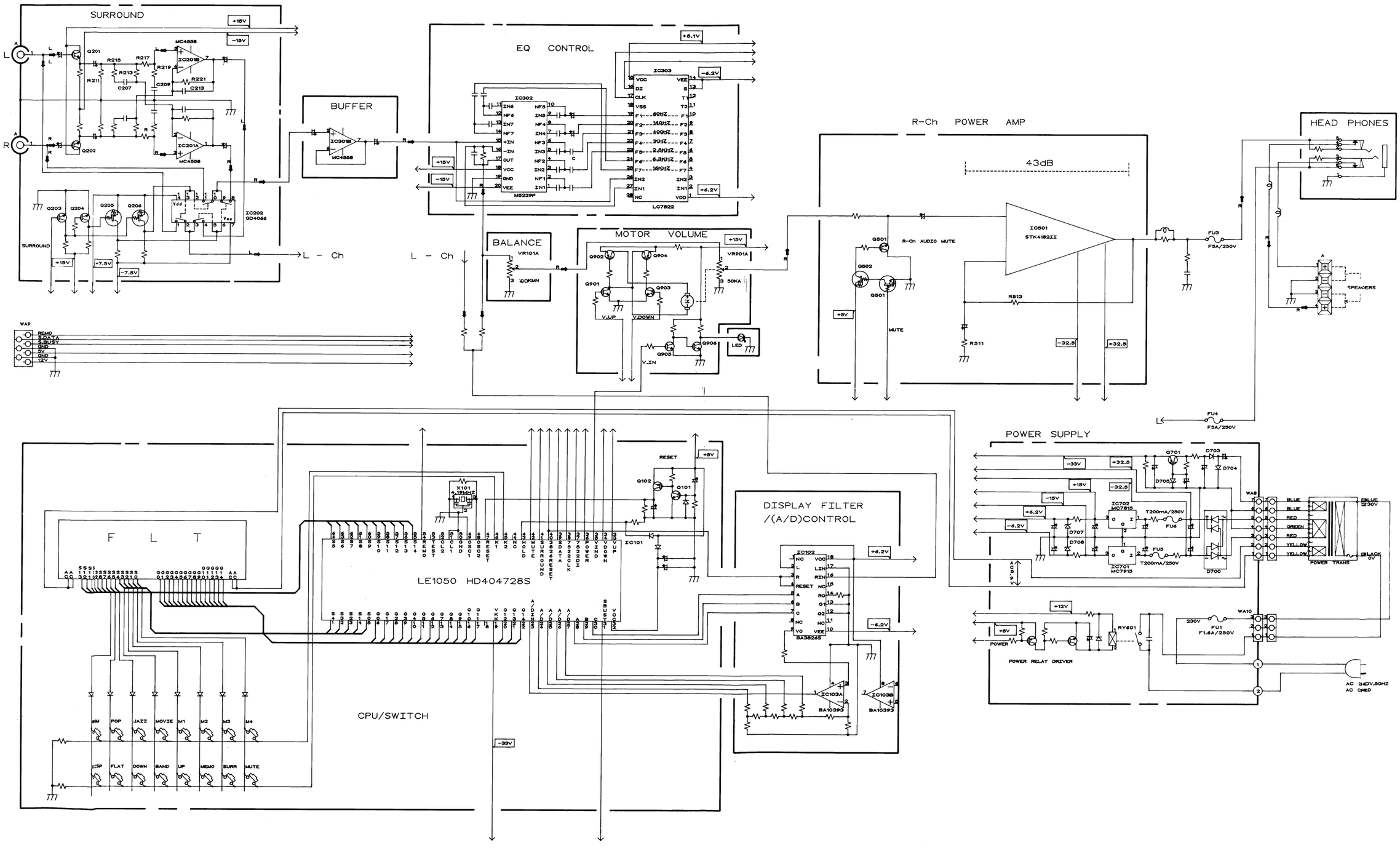
AMP PART

SPECIFICATIONS

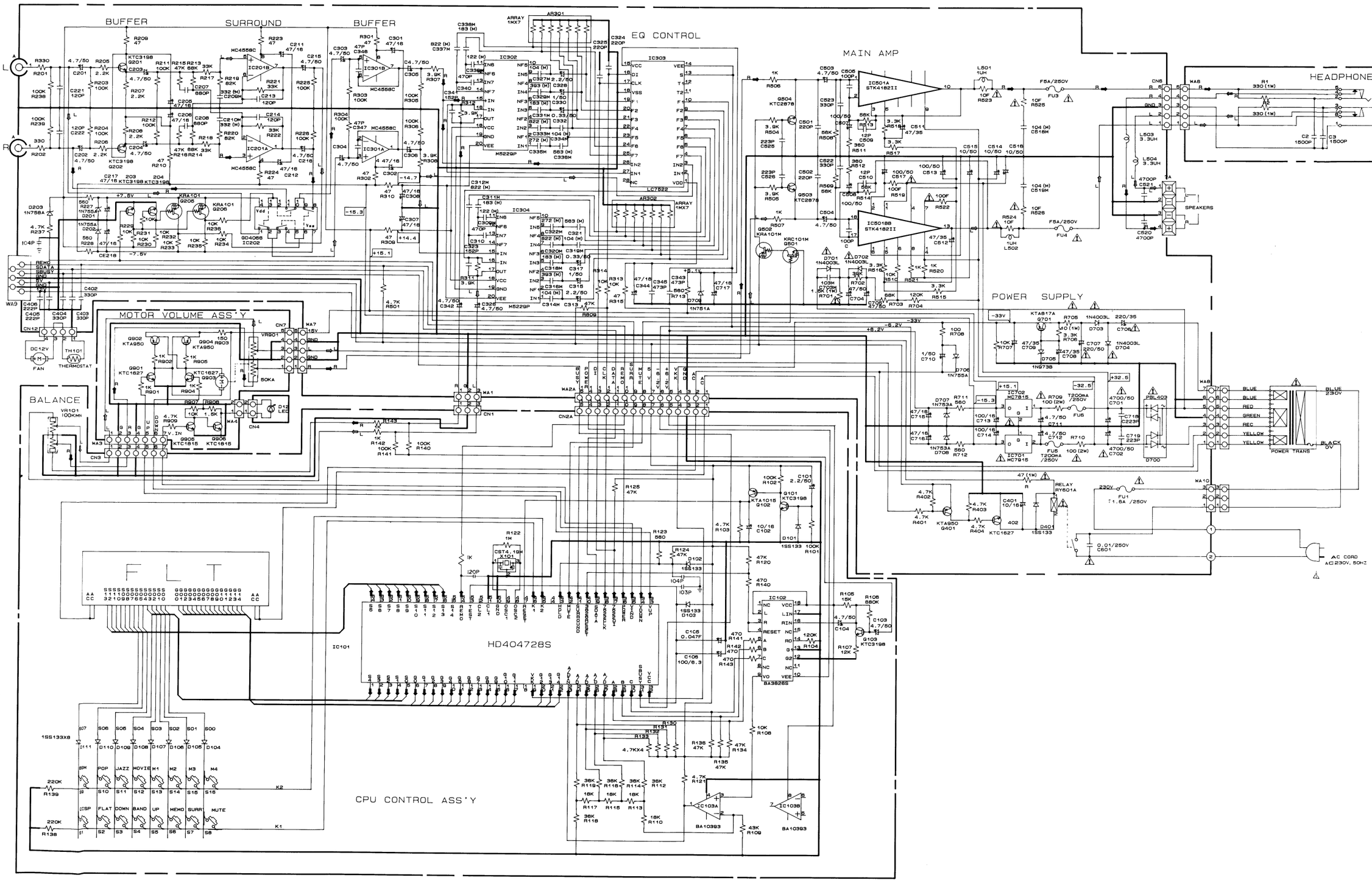
FORMAT

Power Supply	230V/50Hz
Output Power	50W + 50W(1 KHz,0.3 %,8 Ω)
THD	0.1 %(1 KHz,1/10 Power)
Frequency Response	± 1 dB(20 ~ 20000 Hz)
Input Sensitivity	SIGNAL INPUT 160 mV(1 KHz)
Signal-to-Noise Ratio (S/N)	80/90 dB (1KHz,DIRECT/WTD)
Spectrum Analyzer Section	
Center Frequencies	60Hz,160Hz,400Hz,1KHz
	2.5KHz,6.3KHz,16KHz
EQ Control	±8dB
Channel Seperation 100Hz	48 dB
10KHz	43 dB
Speaker Load Impeadance	8 OHMS
Power Consumption	210 Watts
Weight(Net)	5.8 Kg
Dimensions	270(W) * 110(H) * 330(D)

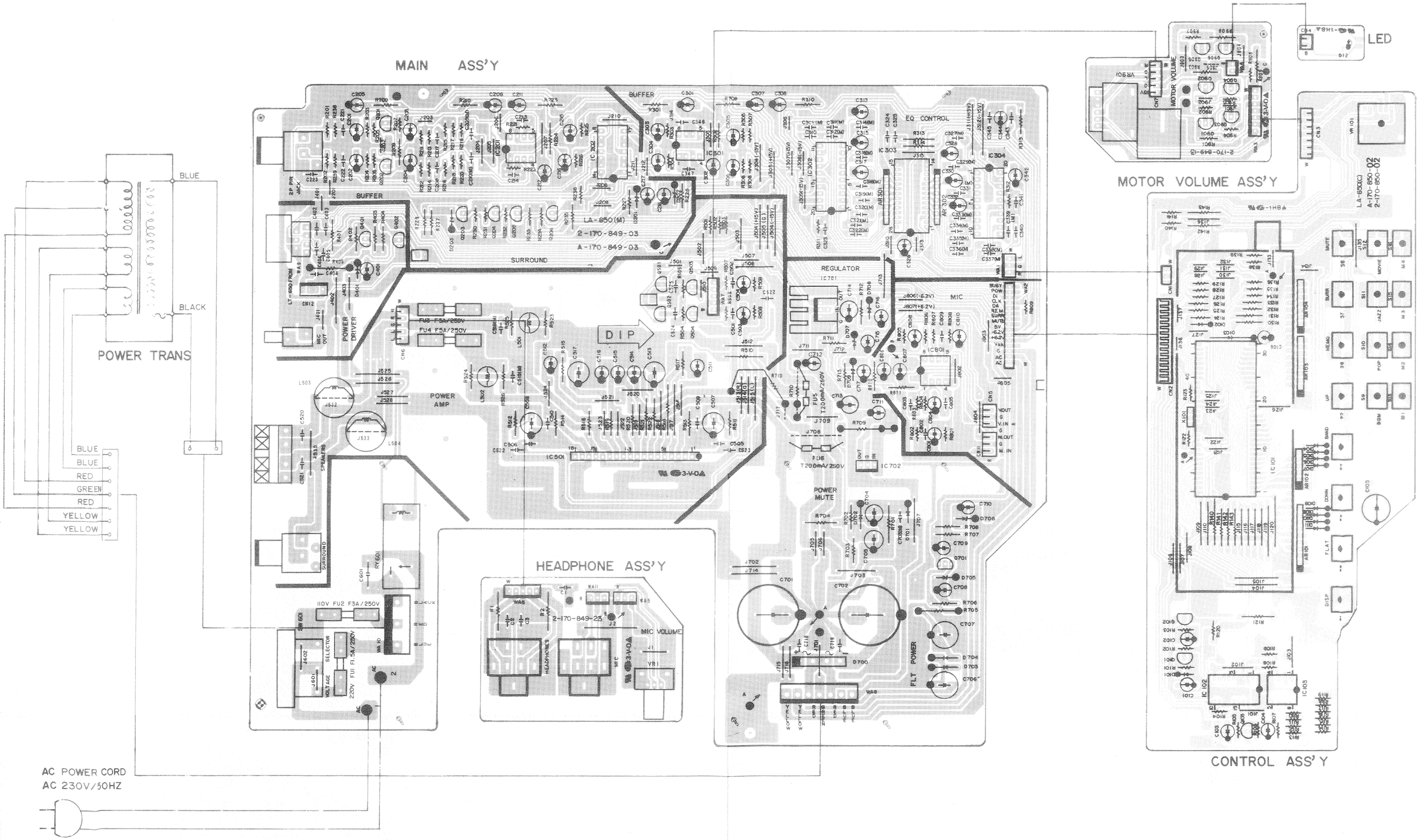
BLOCK DIAGRAM



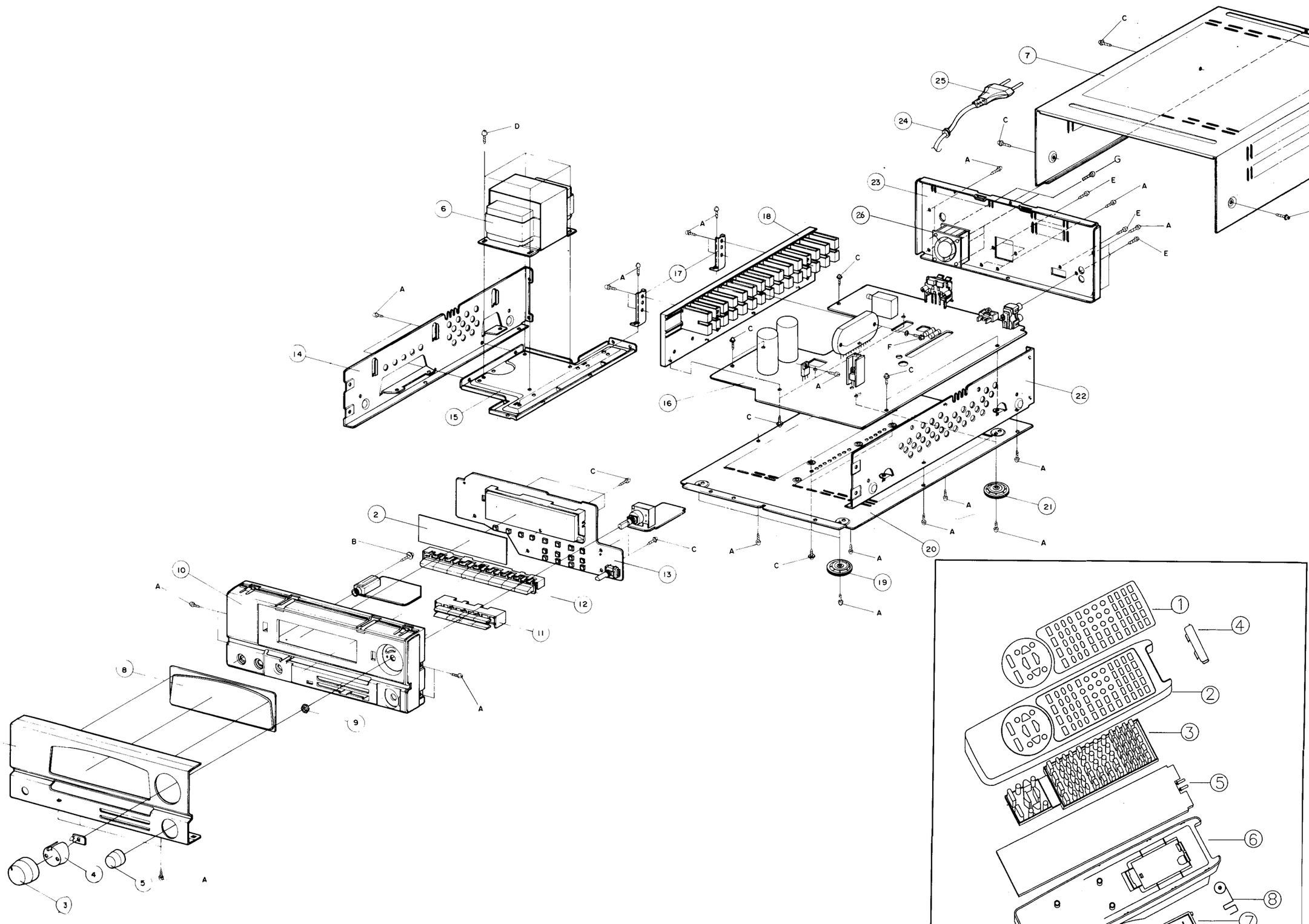
SCHEMATIC DIAGRAM



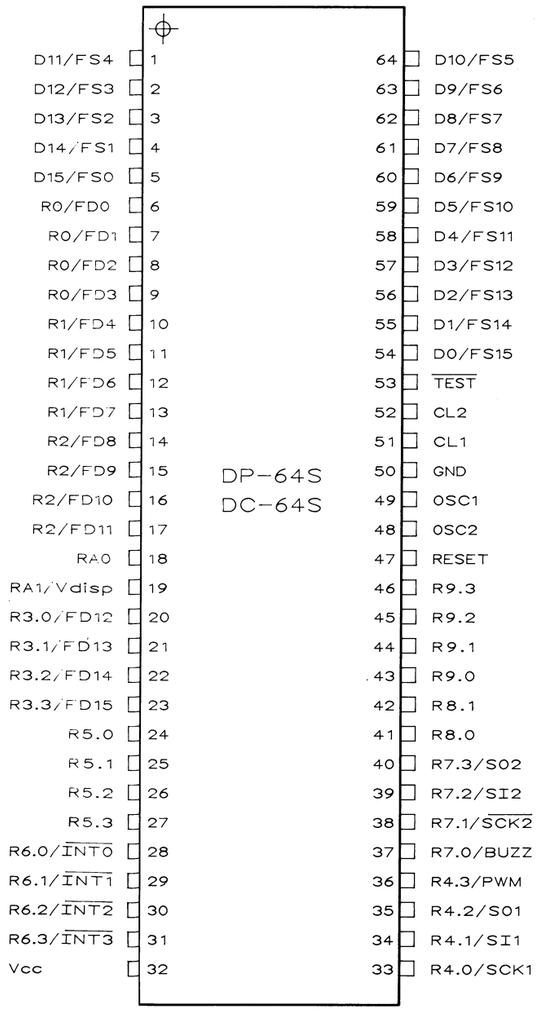
WIRING DIAGRAM



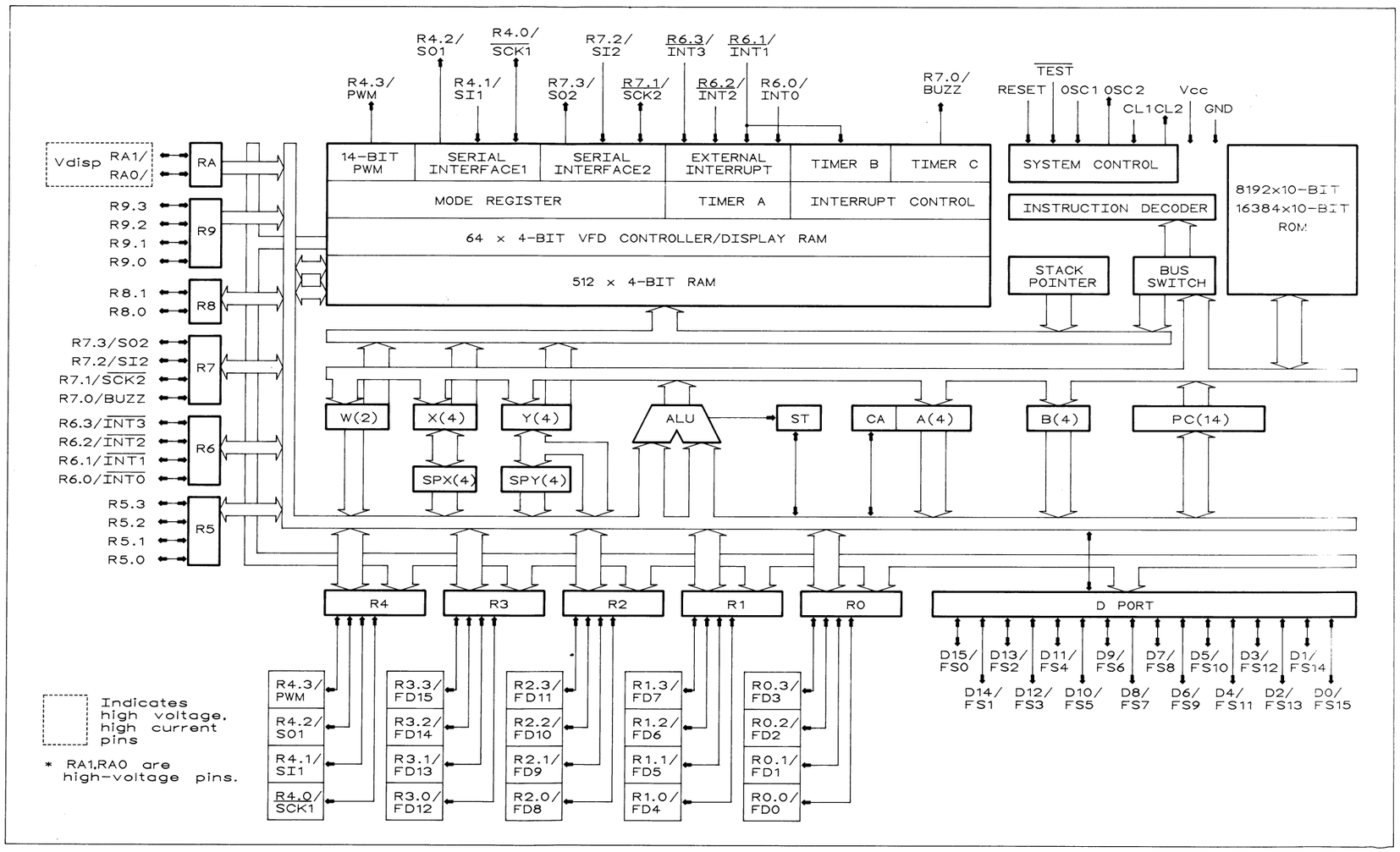
EXPLODED VIEW



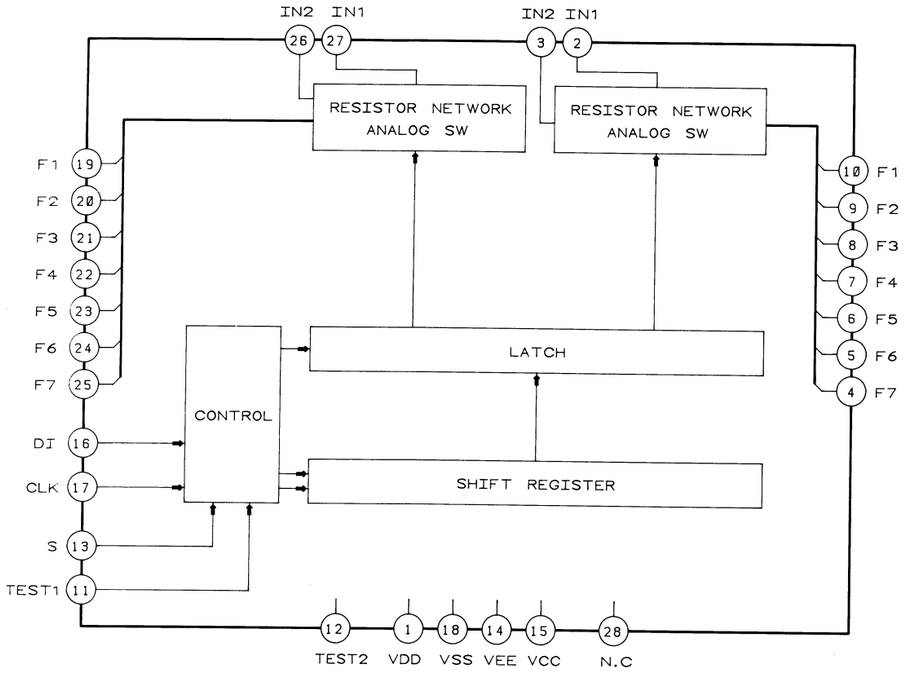
I.C. BLOCK DIAGRAM



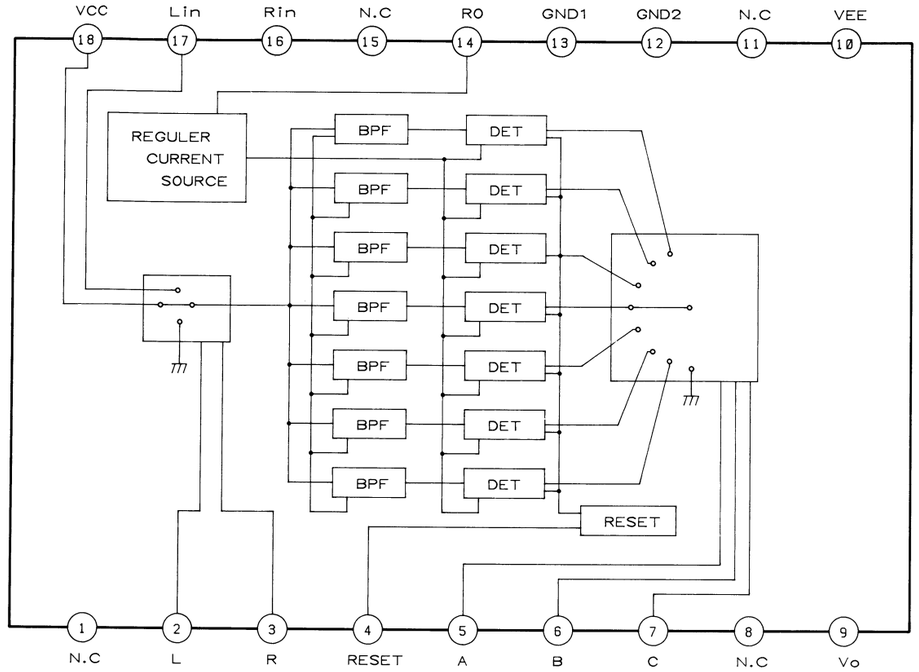
IC101
HD404728S MICOM(CPU)



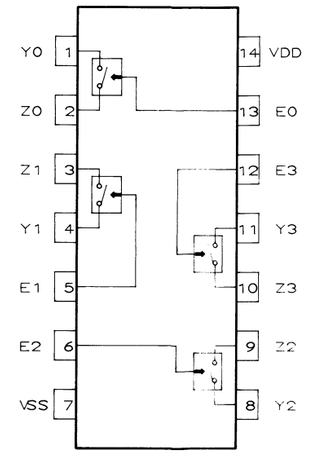
IC 303
LC7522 ELECTRONIC VOLUME CONTROL FOR GRAPHICS EQ



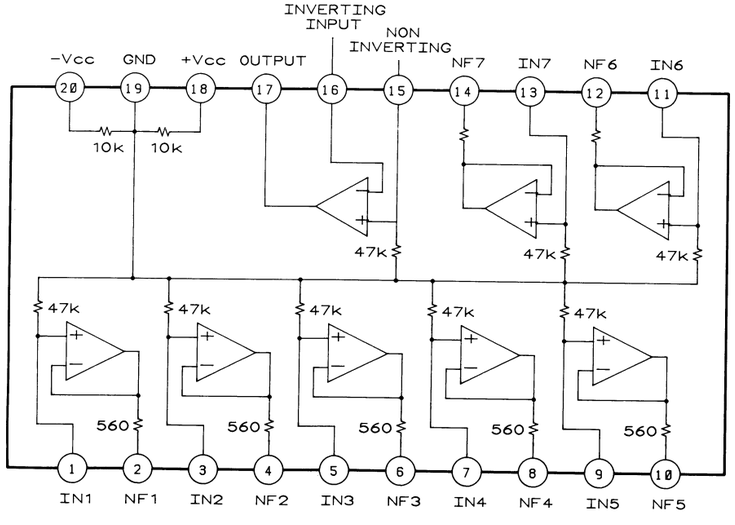
IC 102
BA3826S BAND-PASS FILTER FOR SPECTRUM ANALYZER



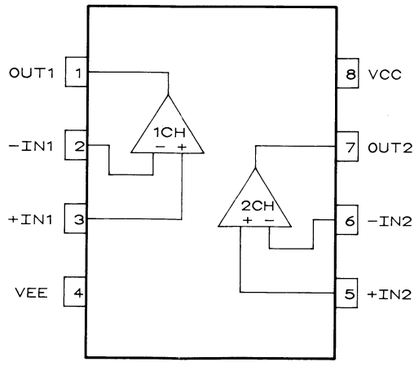
IC 202
GD4066 SWITCHS
FOR INPUT SIGNAL/SURROUND



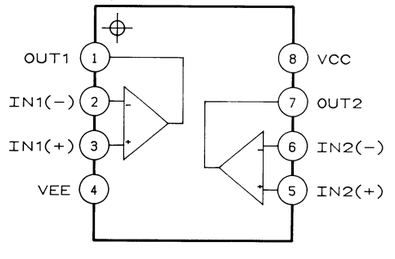
IC 302,304
M5229P HI-FI 7-ELEMENT GRAPHIC EQ


INVERTING INPUT
NON INVERTING
-Vcc GND +Vcc OUTPUT NF7 IN7 NF6 IN6
20 19 18 17 16 15 14 13 12 11
10k 10k
47k
560
1 2 3 4 5 6 7 8 9 10
IN1 NF1 IN2 NF2 IN3 NF3 IN4 NF4 IN5 NF5

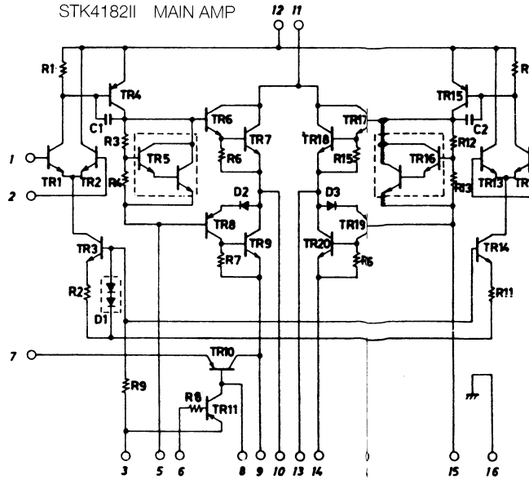
IC 103
BA10393 DUAL COMPARATOR



IC 201,301
KIA4558 OP-AMP



IC501
STK4182II MAIN AMP



LIST OF I.C. VOLTAGE

IC 101	PIN NO.	1	2	3	4	5	6	7	8	9	10
LE-1050	VOLT(V)	-29.5	-29.5	-31.5	-31.5	-2.7	- 30	- 30	- 30	- 30	- 30
	PIN NO.	11	12	13	14	15	16	17	18	19	20
	VOLT(V)	- 30	- 30	- 30	- 30	- 30	- 30	- 30	0	-32.3	- 30
	PIN NO.	21	22	23	24	25	26	27	28	29	30
	VOLT(V)	- 30	- 30	0.11	0.35	0.47	0.36	0.42	1.82	2.8	2.8
	PIN NO.	31	32	33	34	35	36	37	38	39	40
	VOLT(V)	5.15	5.3	0	0	5.18	0	0	0	5.16	0.5
	PIN NO.	41	42	43	44	45	46	47	48	49	50
	VOLT(V)	5.2	0	5.3	1.8	0	0	0	2.4	2.4	0
	PIN NO.	51	52	53	54	55	56	57	58	59	60
	VOLT(V)	0	3	5.3	5.6	0	-27.5	- 32	-29.8	-32	-32
	PIN NO.	61	62	63	64						
	VOLT(V)	-32.2	-31.8	-31.8	-31.8						

IC 102	PIN NO.	1	2	3	4	5	6	7	8	9	10
BA3826S	VOLT(V)	0	6.25	0.5	0.5	1.78	2.75	2.75	0	0	-6.12
	PIN NO.	11	12	13	14	15	16	17	18		
	VOLT(V)	0	0	0	1.42	0	0	0	6.25		

IC 103	PIN NO.	1	2	3	4	5	6	7	8		
BA10393	VOLT(V)	0.2	0.2	0	0	1.1	1.1	0	6.25		

IC 201	PIN NO.	1	2	3	4	5	6	7	8		
MC4558	VOLT(V)	0	0	0	-15.4	0	0	0	15.1		

IC 202	PIN NO.	1	2	3	4	5	6	7	8	9	10
GD4066	VOLT(V)	0	0	0	0	-7.7	-7.7	-7.7	0	0	
	PIN NO.	11	12	13	14						
	VOLT(V)	0	7.65	7.65	7.65						

IC 301	PIN NO.	1	2	3	4	5	6	7	8		
MC4558	VOLT(V)	0	0	0	-15.4	0	0	0	15.1		

IC 302	PIN NO.	1	2	3	4	5	6	7	8	9	10
M5229P	VOLT(V)	0	0	0	0	0	0	0	0	0	0
	PIN NO.	11	12	13	14	15	16	17	18	19	20
	VOLT(V)	0	0	0	0	0	0	0	14.4	0	-14.7

IC 303	PIN NO.	1	2	3	4	5	6	7	8	9	10
LC7522	VOLT(V)	6.25	0	0	0	0	0	0	0	0	0
	PIN NO.	11	12	13	14	15	16	17	18	19	20
	VOLT(V)	-6.13	-6.1	-6.13	-6.13	5.3	0	0	0	0	0
	PIN NO.	21	22	23	24	25	26	27	28		
	VOLT(V)	0	0	0	0	0	0	0	0		

IC 304	PIN NO.	1	2	3	4	5	6	7	8	9	10
M5229P	VOLT(V)	0	0	0	0	0	0	0	0	0	0
	PIN NO.	11	12	13	14	15	16	17	18	19	20
	VOLT(V)	0	0	0	0	0	0	0	14.4	0	-14.7

IC 501	PIN NO.	1	2	3	4	5	6	7	8	9	10
STK4182 II	VOLT(V)	-0.17	-0.17	0	- 36	-1.3	0.4	-37.5	-38.2	-38.6	0
	PIN NO.	11	12	13	14	15	16	17	18		
	VOLT(V)	38.3	37.2	0	-38.6	-1.1	0	-0.17	-0.17		

IC 701	PIN NO.	1	2	3							
MC7915	**VOLT(V)**	**0**	**- 31**	**-15.6**							

IC 702	PIN NO.	1	2	3							
MC7815	VOLT(V)	27.6	0	15.3							

CD PART

SPECIFICATIONS

FORMAT

Type ..... Compact disk digital audio system
Disk Used
Playing Time ..... Approx,60mm one side
Diameter ..... 120mm,80mm(Single Type)

SINGLE FORMAT

Sampling Frequency 44.1KHz
Transmission Bit Rate ..... 4.3218M Bit/Sec
Quantization Number ..... 1Bit D/A Converter

PICK-UP

System ..... Object Lense Drive System
Optical Pick-Up
Optical Source ..... 3Beam Semiconductor Laser
Wave Length 780nm

AUDIO PART

Channels ..... 2 Channel(stereo)
Frequency Response ..... 20 -- 20000 Hz(±1.5 dB)(EIAJ)
Dynamic Range ..... 88dB(1KHz)(EIAJ)
S/N Ratio ..... 92dB(1KHz)(EIAJ)
T.H.D ..... 0.008(1KHz)
Channel Seperation ..... 80dB(1KHz)(EIAJ)
Wow/Flutter ..... Less Than Measurable Limit
Output ..... 2V(1KHz)

GENERAL

Dimensions ..... 270(W) * 80(H) * 330(D)
Weight(Net) 3Kg

NOTE : Specifications and design subject to possible modification without notice,due to improvements.

LASER SICHERHEITSHINWEISE / LASER SAFETY

1. Umgang mit der Laserabtasteinheit

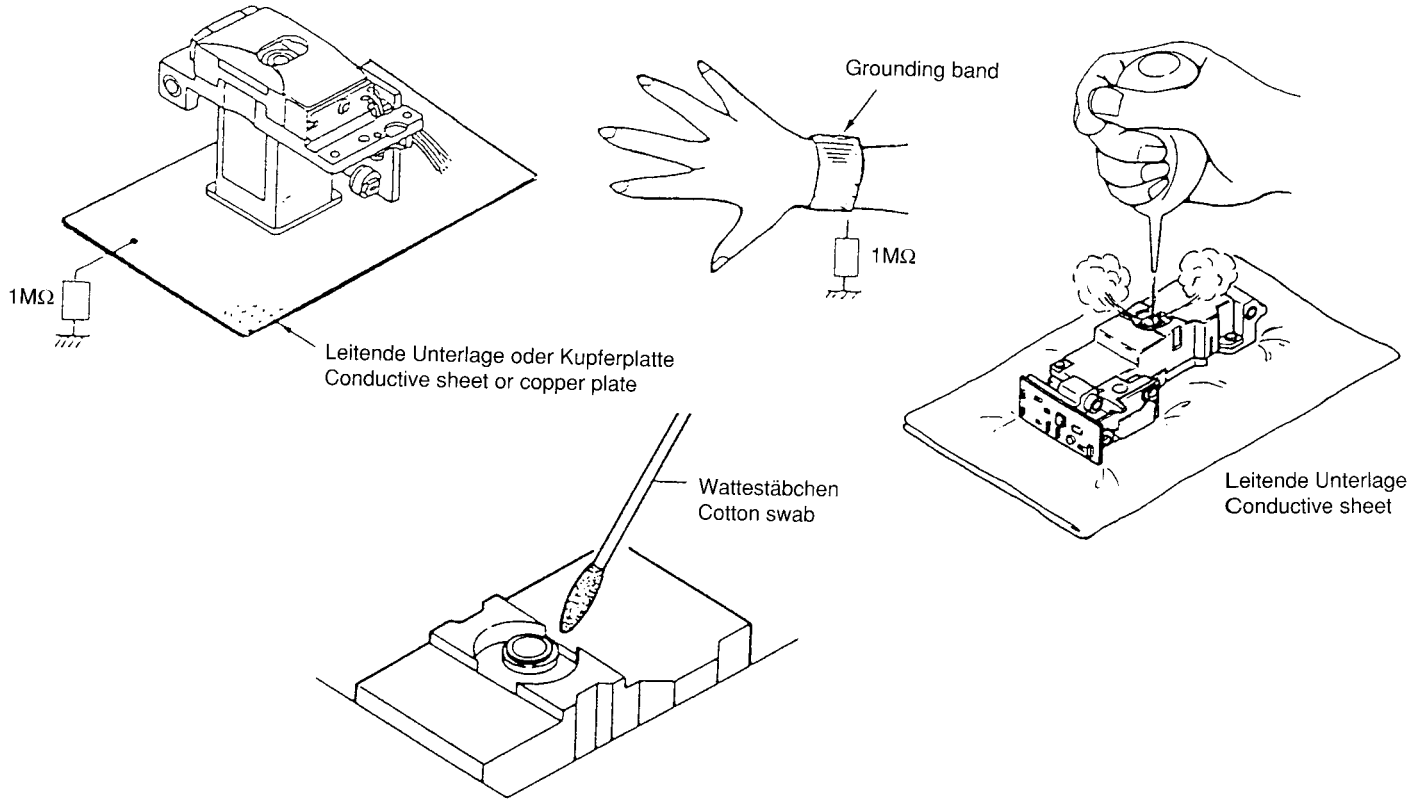
Da die Laserdiode in der Abtasteinheit bereits durch geringe statische Spannungen zerstört wird, muß beim Wechsel der Abtasteinheit besonders vorsichtig vorgegangen werden.

Beim Reinigen der beweglichen Linie der Abtasteinheit mittels Druckluft oder eines mit Isopropylalkohol getränkten Wattestäbchen ist ebenfalls Vorsicht geboten.

1. Handling the pick-up

As the laserdiode of pick-up already breaks down by low static electricity, there fore take care if remove the pick up.

Take care the cleaning of oscillating pick-up lense with pressed air or isopropyl alcohol mountened cotton swab.



Laserschutzbrillen

Je nach Sichtverhältnissen bietet die Fa. LASER VISION Laserschutzbrillen nach DIN für Normalsichtige und Brillenträger an.

Adresse: LASER VISION
Vertrieb von Laserschutzprodukten GmbH
Berliner Straße 9B
8550 Forchheim
Telefon: 0 91 91/20 61
Telefax: 0 91 91/6 69 13

Empfehlung von Laserschutzbrillen der Fa. LASER VISION:

Bügelbrille für Normalsichtige
Art.-No.: 00.268.00
Brillentyp: L-02
Filtertyp: 68
Schutzstufe: L4A

Brillenträgerausführung
Art.-Nr.: 00.368.00
Brillentyp: L-03
Filtertyp: 68
Schutzstufe: L4A

Die Tageslichttransmission beider Brillen liegt bei 52% und die Filterfarbe ist grün.

Laser goggles

According as eye side the firm LASER VISION sells DIN laser goggles for good eyes and defectively sighted eyes (with glasses).

Address: LASER VISION
Vertrieb von Laserschutzprodukten GmbH
Berliner Straße 9B
8550 Forchheim
Telefon: 0 91 91/20 61
Telefax: 0 91 91/6 69 13

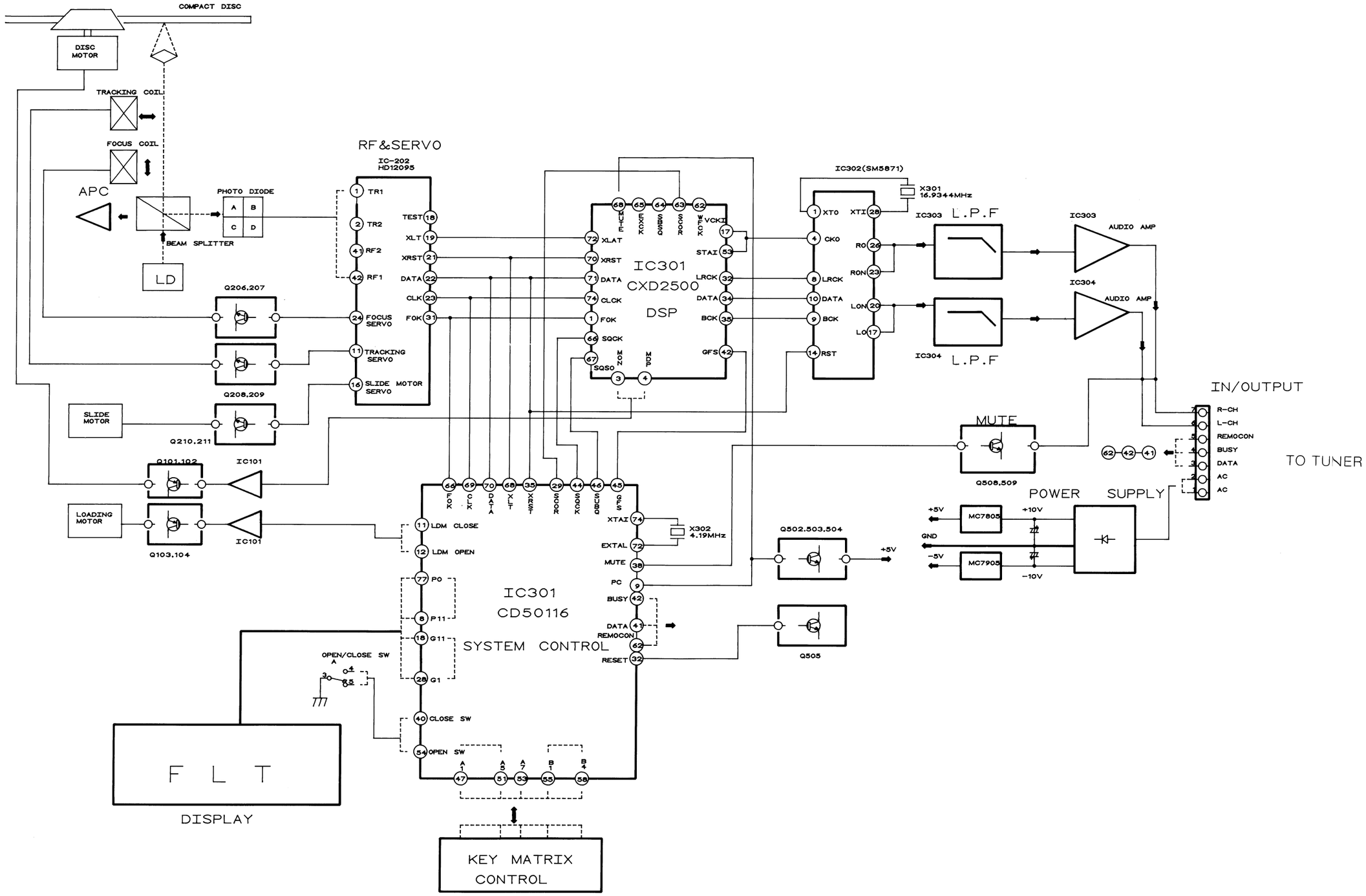
Recommenduction of LASER VISION-laser goggles:

Goggles for good eyes
Article-no.: 00.268.00
Model type: L-02
Filter type: 68
Protection level: L4A

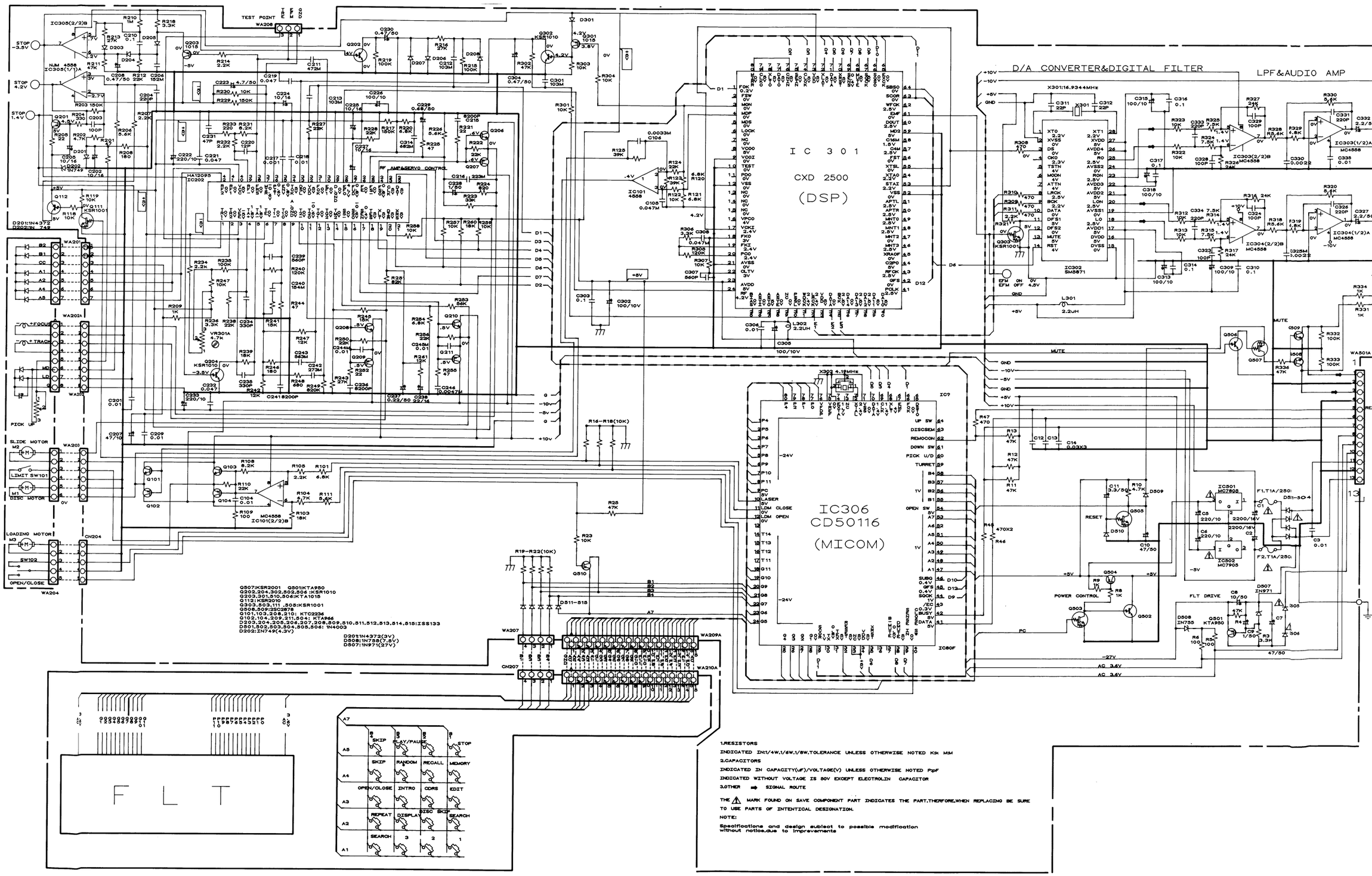
Goggles for wearer of glasses
Article no.: 00.368.00
Model type: L-03
Filter type: 68
Protection level: L4A

The daylight transmission is 52% and the filter colour is green.

BLOCK DIAGRAM

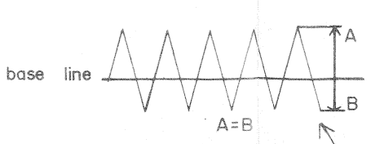


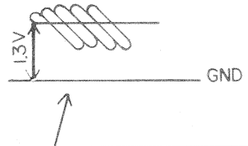
SCHEMATIC DIAGRAM

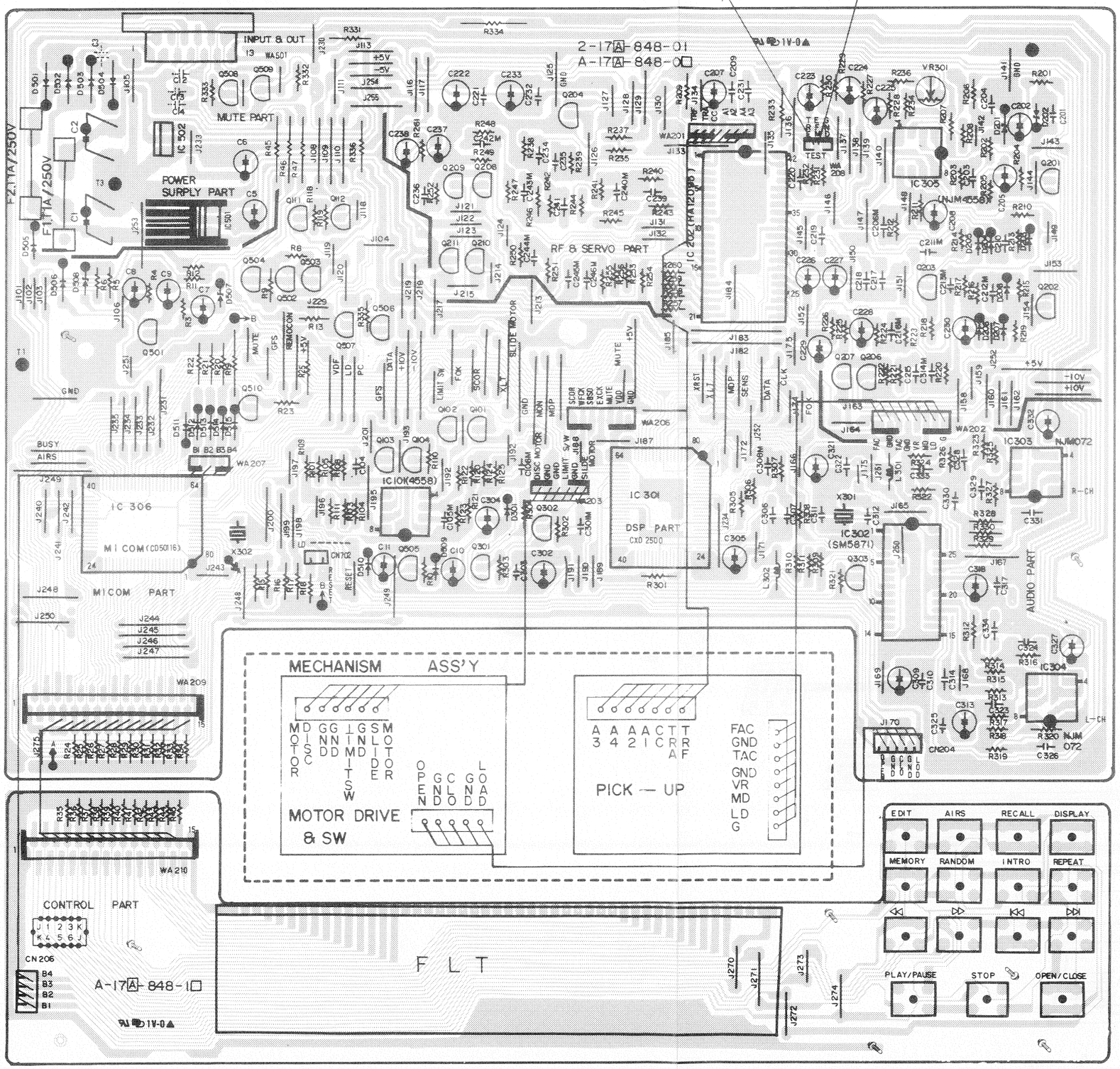


WIRING DIAGRAM

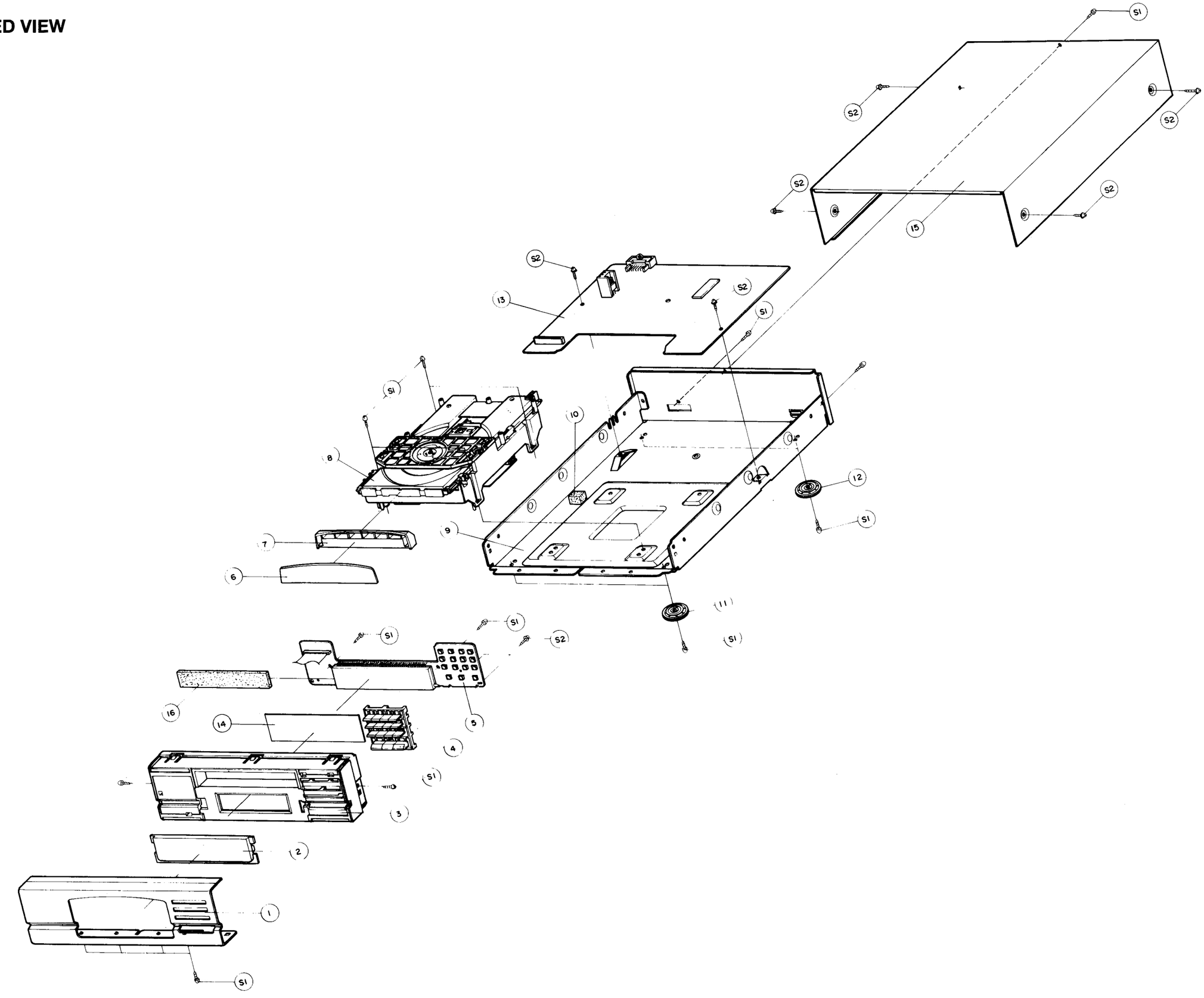
FROM TUNER



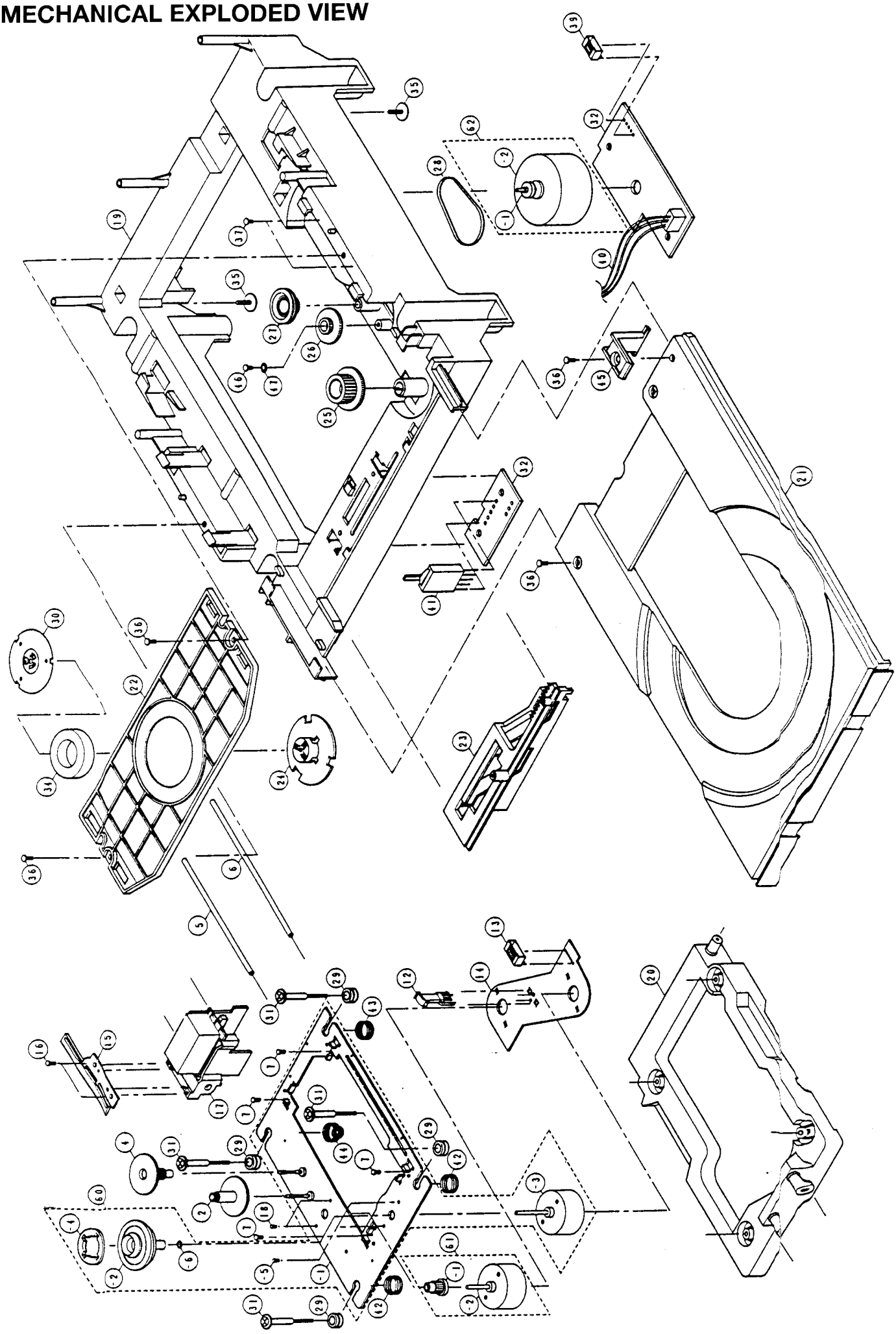




EXPLODED VIEW



MECHANICAL EXPLODED VIEW



ADJUSTMENT

TRACKING BALANCE ADJUSTMENT AND EYE PATTERN

Purpose: To adjust the tracking servo offset to zero.
Adjustment symptoms: Search times too long, poor playbility, carriage run-away.
* Connect an oscilloscope to test points WA208 (TRE) and WA208 (GND). (Figure 2)
* Turn on the power and load the test disc in the disc tray, and push the play buttom.
* Press continuously the track search buttom (▶▶I).
* Using an oscilloscope, observe the tracking error signal durung track search, adjust VR301 (Tracking Balance) to set the positive and negative amplitudes to the same levels as shown Figure 1.
* Connect an oscilloscope to Eye pattern test points WA208 (EFM) and WA208 (GND). (Figure 3)

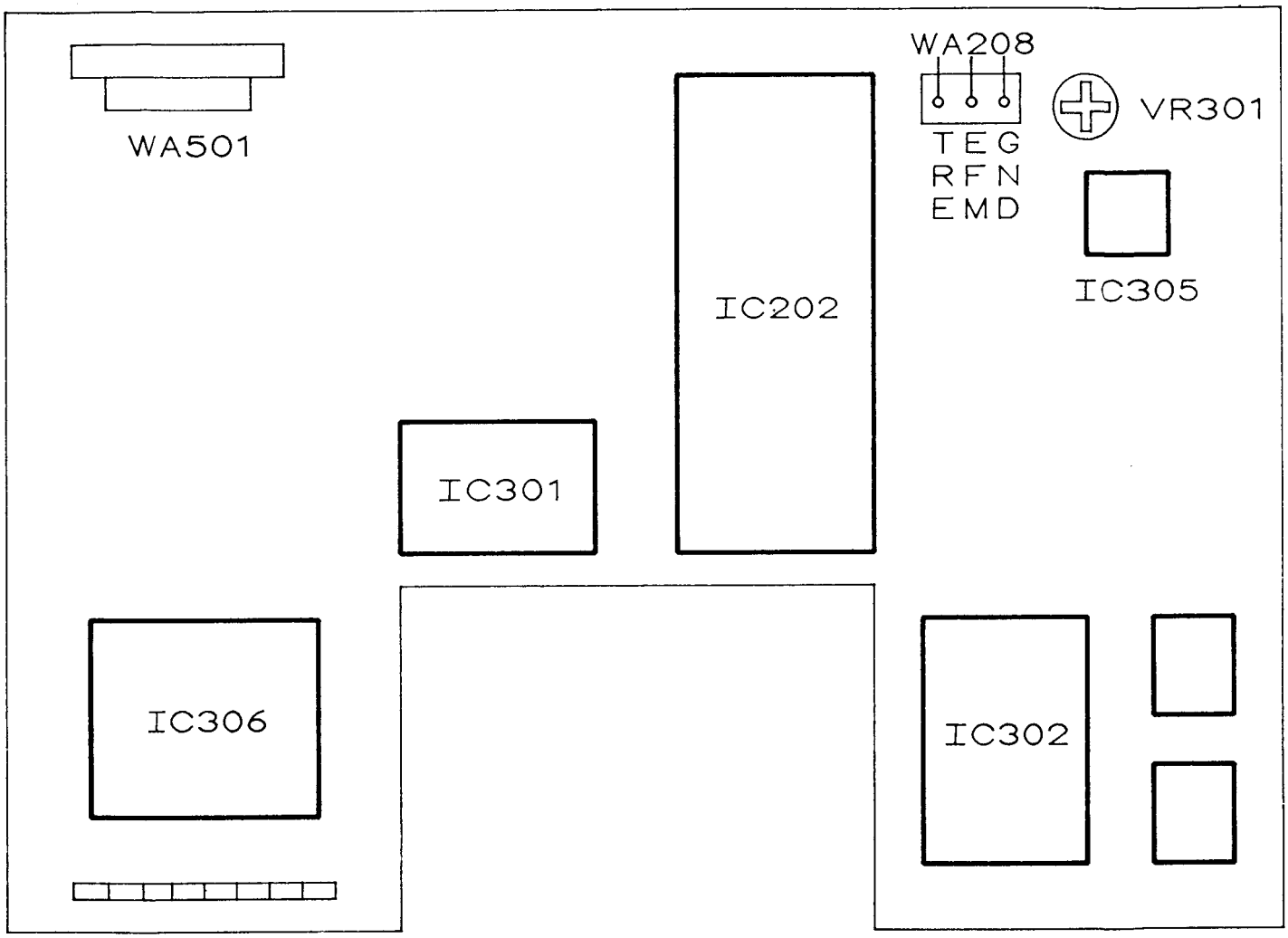
CAUTION

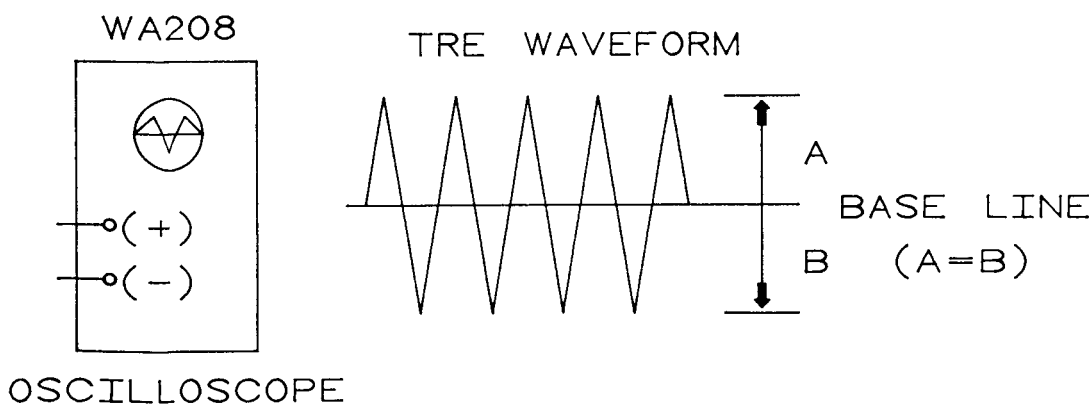
1 Load clean and scratch free disc and confirm EFM waveform (Fig. 3) shows 1.3 V ± 0.2 V.
  If out of specification, adjust and check as per shown below.
1 Clean object lens if there is any dirt or dust on it.
2 If unable to obtain 1.3 V ± 0.2 V after step 1, adjust semi-fixed resistor of pickup mechanism so that laser power outputs 1.3 V EFM waveforms. During the adjustment, keep the pickup mechanism horizontally.
3 After laser power adjustment, do the troubleshooting, No needd to lock point semi-fixed resistor.

NOTE

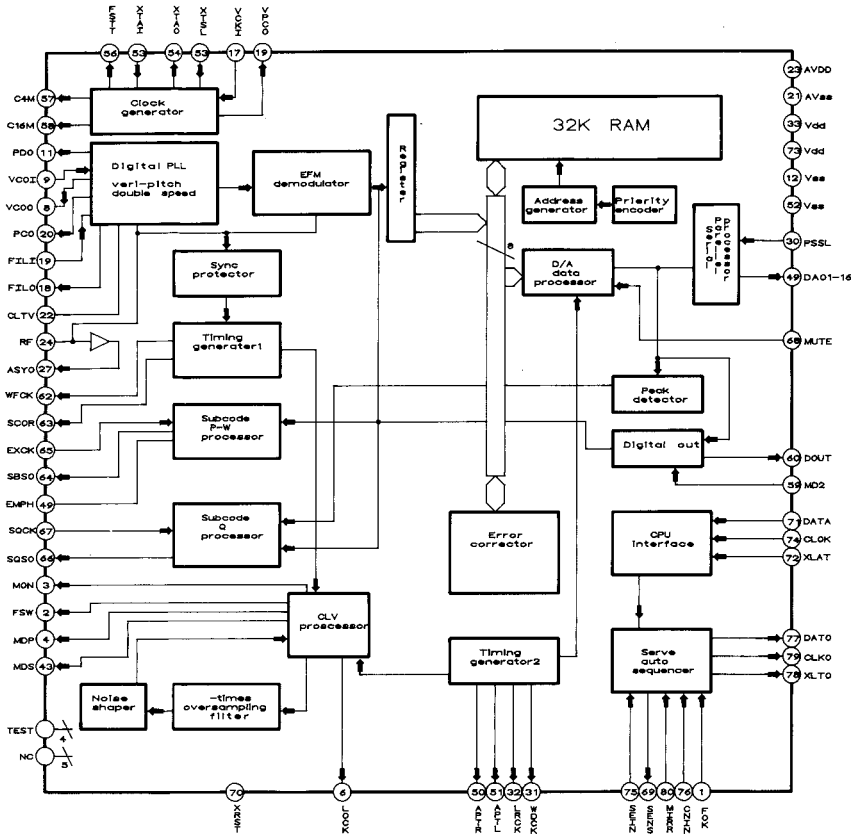
ADJUSTMENT

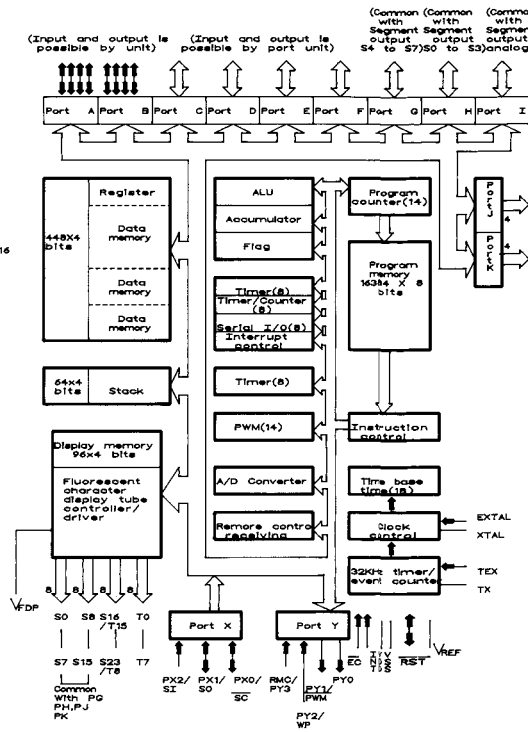
ADJUSTMENT POINT



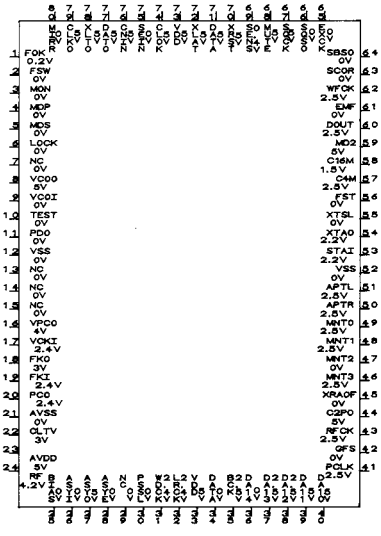


I.C. BLOCK DIAGRAM

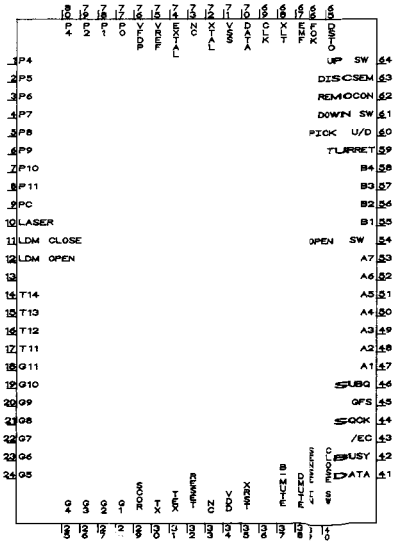




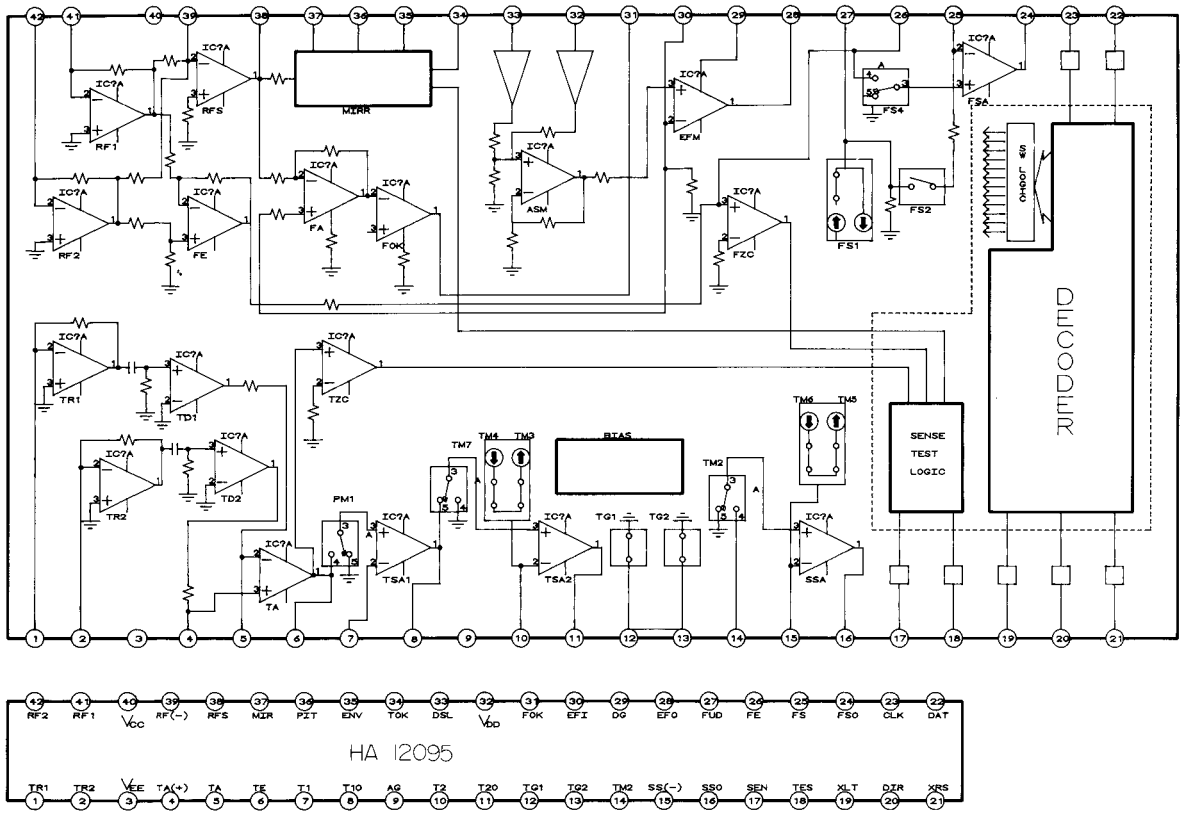
IC301
CXD2500
(DSP)



IC306
CD50116
(MICOM)

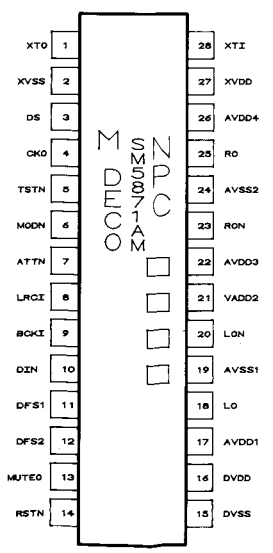


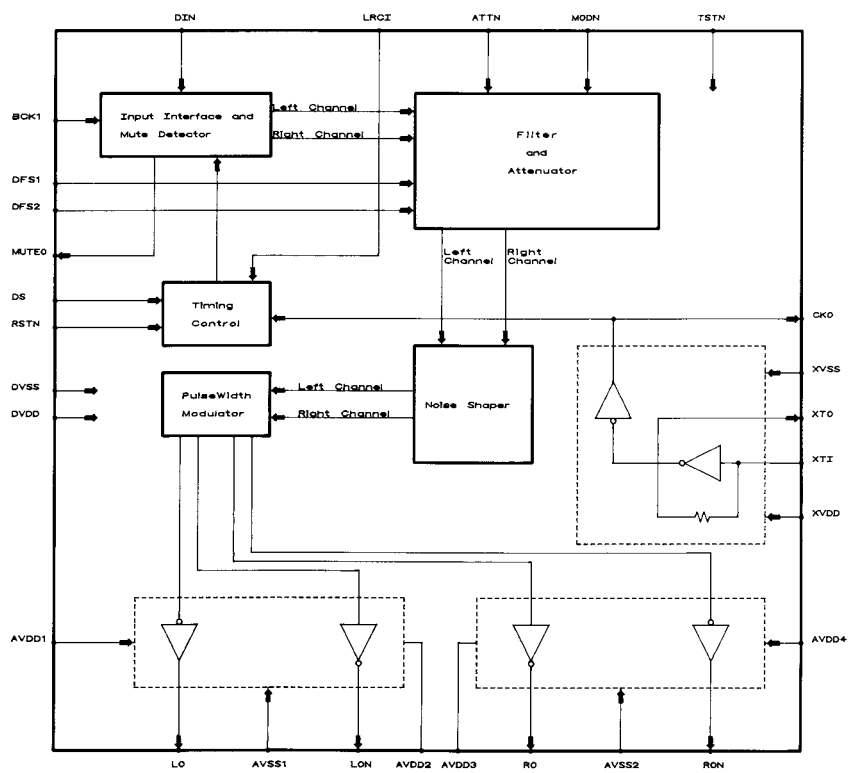
IC202
HA12095



RF2 RF1 VCC RF(-) RFS MIR PIT ENV TOK DSL VDD FOK EFI DG EFO FUD FE FS FSO CLK DAT
HA 12095
TR1 TR2 VEE TA(+) TA TE T1 T10 AG T2 T20 TG1 TG2 TM2 SS(-) SSO SEN TES XLT DIR XRS

IC302
SM5871





LIST OF I.C. VOLTAGE

IC101 MC4558		1	2	3	4	5	6	7	8			
		0.4	0	0	-10	0	0	0	+10			
IC202 HA12095		1	2	3	4	5	6	7	8	9	10	11
		TR1	TR2	Vee	TA+	TA-	TE	TI	T10	AG	T2	T20
		0	0	-5	1.8	1.8	0	0	0	0	0	0.5
		12	13	14	15	16	17	18	19	20	21	22
		TG1	TG2	TM2	SS-	SSO	SEN	TES	XLT	DIR	XRS	DAT
		0	0	0	0	0.5	0.4	5	5	5	5	5
		23	24	25	26	27	28	29	30	31	32	33
		CLK	FSO	FS	FE	FUD	EFO	DG	EFI	FOK	Vdd	PSL
		5	0.8	0	0	0.8	4.7	0	0	0	2.5	0
		34	35	36	37	38	39	40	41	42		
		TOK	ENV	PL	MIR	RFS	RF-	Vcc	RF1	RF2		
		5	0.8	0.5	0.5	0.5	0	5	0	0		
IC301 CXD2500	Pin NO	1	2	3	4	5	6	7	8	9	10	11
	Name	FOK	FSW	MON	MDP	MDS	LOCK	NC	VCOO	VCOI	TEST	PDO
	VOLT(V)	0.2	0	0	0	0	0	0	5	0	0	0
		12	13	14	15	16	17	18	19	20	21	22
		Vss	NC	NC	NC	VPCO	VCKI	FKO	FKI	PCO	AVss	CLTV
		0	0	0	0	4	2.4	3	2.4	2.4	0	3
		23	24	25	26	27	28	29	30	31	32	33
		AVdd	RF	BIAS	ASYI	ASYO	ASYF	NC	Pss	WDCK	LRCK	Vdd
		5	4.2	0	0	5	0	0	0	2.4	2.4	5
		34	35	36	37	38	39	40	41	42	43	44
		DATA	BCK	DA14	DA13	DA12	DA11	DA10	PCLK	GFS	RFCK	C2PO
		0	2.5	0	2.5	2.5	5	5	2.5	0	2.5	5
		45	46	47	48	49	50	51	52	53	54	55
		XRAO	MNT3	MNT2	MNT1	MNTO	APIR	APTL	Vss	STAI	XTSI	XTSL
		0	2.5	0	2.5	2.5	2.5	2.5	0	2.2	2.2	0

		56	57	58	59	60	61	62	63	64	65	66
		FST	C4M	C16M	MD2	DOUT	EMF	WFCK	SCOR	SBSO	EXCK	SQSO
		0	2.5	1.5	5	2.5	2.5	0	0	0	0	5
		67	68	69	70	71	72	73	74	75	76	77
		SQCK	MUTE	SENS	XRST	DATA	XLAT	Vdd	CLOK	SEIN	CNTN	DATO
		5	5	0.4	5	5	5	5	5	5	5	5
		78	79	80								
		XLTO	CLKO	MIRR								
		5	5	0								
IC302 SM5871		1	2	3	4	5	6	7	8	9	10	11
		XTO	XVss	DS	CKO	TSTN	MODN	ATTN	LRCK	BCK	DATA	DFS1
		2.2	0	0	2.3	4	4	2.5	2.5	2.2	0	5
		12	13	14	15	16	17	18	19	20	21	22
		DFS2	MUTE	RSTN	DVss	DVdd	AVD1	LO	AVS2	LON	AVdd	AVdd
		0	5	4	0	5	5	2.5	0	2.5	5	5
		23	24	25	26	27	28					
		RON	AVss	RO	AVdd	XVdd	XTI					
		2.5	0	2.5	5	5	2.2					
IC303 NJM072		1	2	3	4	5	6	7	8			
		0	0	0	-10	1.2	1.2	0	10			
IC305 NJM4558	PIN NO	1	2	3	4	5	6	7	8			
	ALL	4.2	-2.7	3	-5	0.7	0.2	-3.5	5			

IC306 CXP50116		1	2	3	4	5	6	7	8	9	10	11
		P4	P5	P6	P7	P8	P9	P10	P11	PC	LD	CLO
		-24	-24	-24	-24	-24	-24	-24	-24	5	5	0
		12	13	14	15	16	17	18	19	20	21	22
		OPE	NC	T14	T13	T12	T11	G11	G10	G9	G8	G7
		0	0	-24	-24	-24	-24	-24	-24	-24	-24	-24
		23	24	25	26	27	28	29	30	31	32	33
		G6	G5	G4	G3	G2	G1	SCOR	TX	TEX	RES	NC
		-24	-24	-24	-24	-24	-24	0	1	0.8	5	5

IC501 MC7805		1	2	3
		-5	0	-10
IC502 MC7905		1	2	3
		10	0	5

DECK PART

SPECIFICATIONS

FORMAT

TYPE ..... 2 MOTOR 2 DECK

HEAD ..... PLAYBACK : 1
REC/PLAY : 1
ERASE : 1

POWER SUPPLY ..... AC 18V / 50 Hz

WOW/ FLUTTER (JIS WTD) ..... < 0.18 %

TAPE SPEED ..... 3000Hz ± 2 %

SIGNAL TO NOISE RATIO

DOLBY OFF CCIR ARM	120uS	> 50 dB
	70uS	> 52 dB
DOLBY B CCIR ARM	120uS	> 60 dB
	70uS	> 62 dB
DOLBY C CCIR ARM	120uS	> 67 dB
	70uS	> 69 dB

FREQUENCY RESPONSE

PB	40~125000Hz ± 5 dB
R/P	40~125000Hz ± 6 dB

CROSSTALK (WITH 1KHz B.P.F) ..... > 50 dB

CH SEPERATION (WITH 1KHz B.P.F) ..... > 40 dB

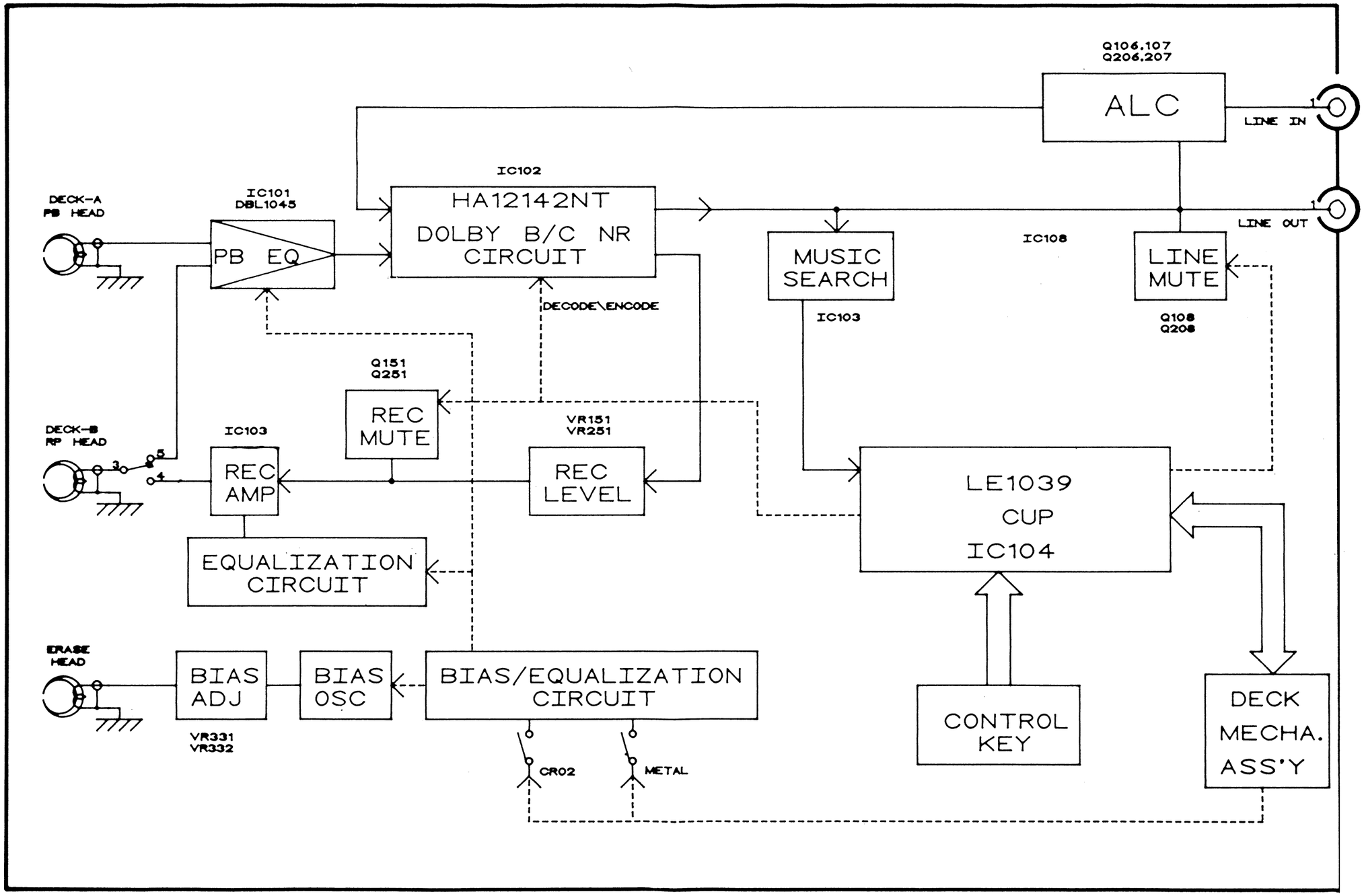
ERASE RATIO (WITH 1KHZ) ..... > 55 dB

T.H.D (120 uS) ..... < 1.5 %

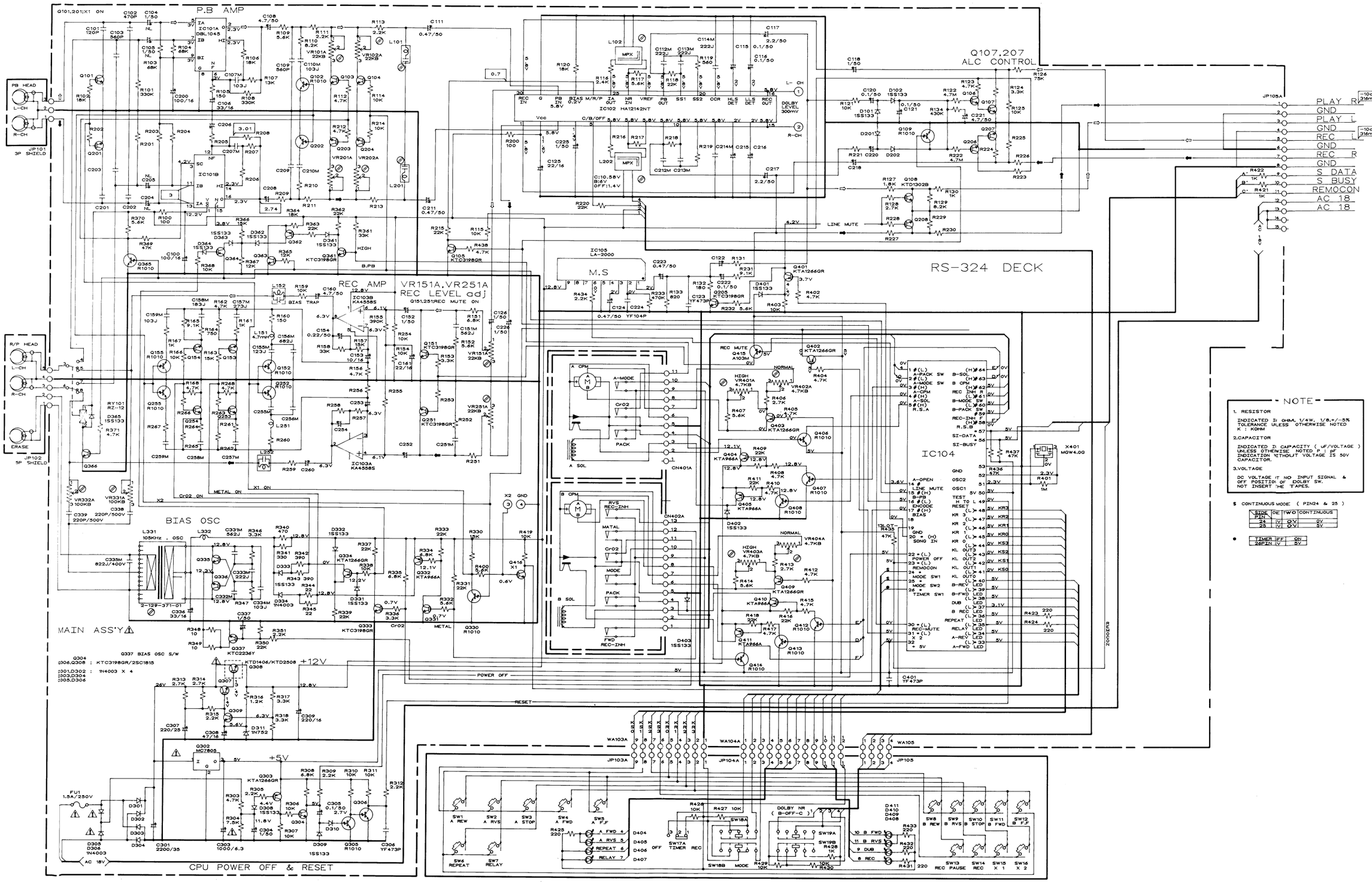
OUT PUT LEVEL (TCC-121,315HZ) ..... 316 mV ± 2 dB

NOTE : Specifications and design subject to possible modification without notice, due to improvements.

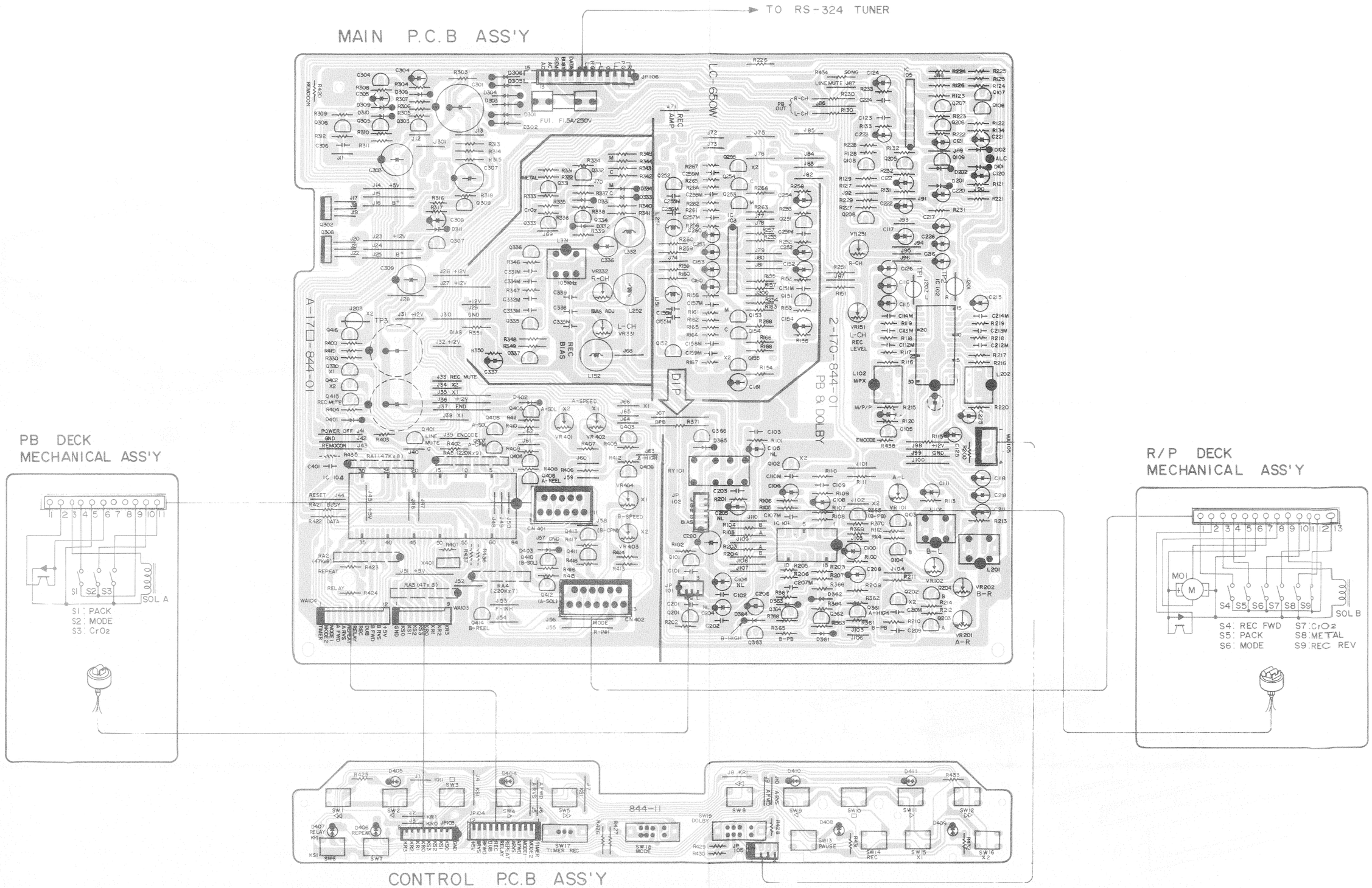
BLOCK DIAGRAM



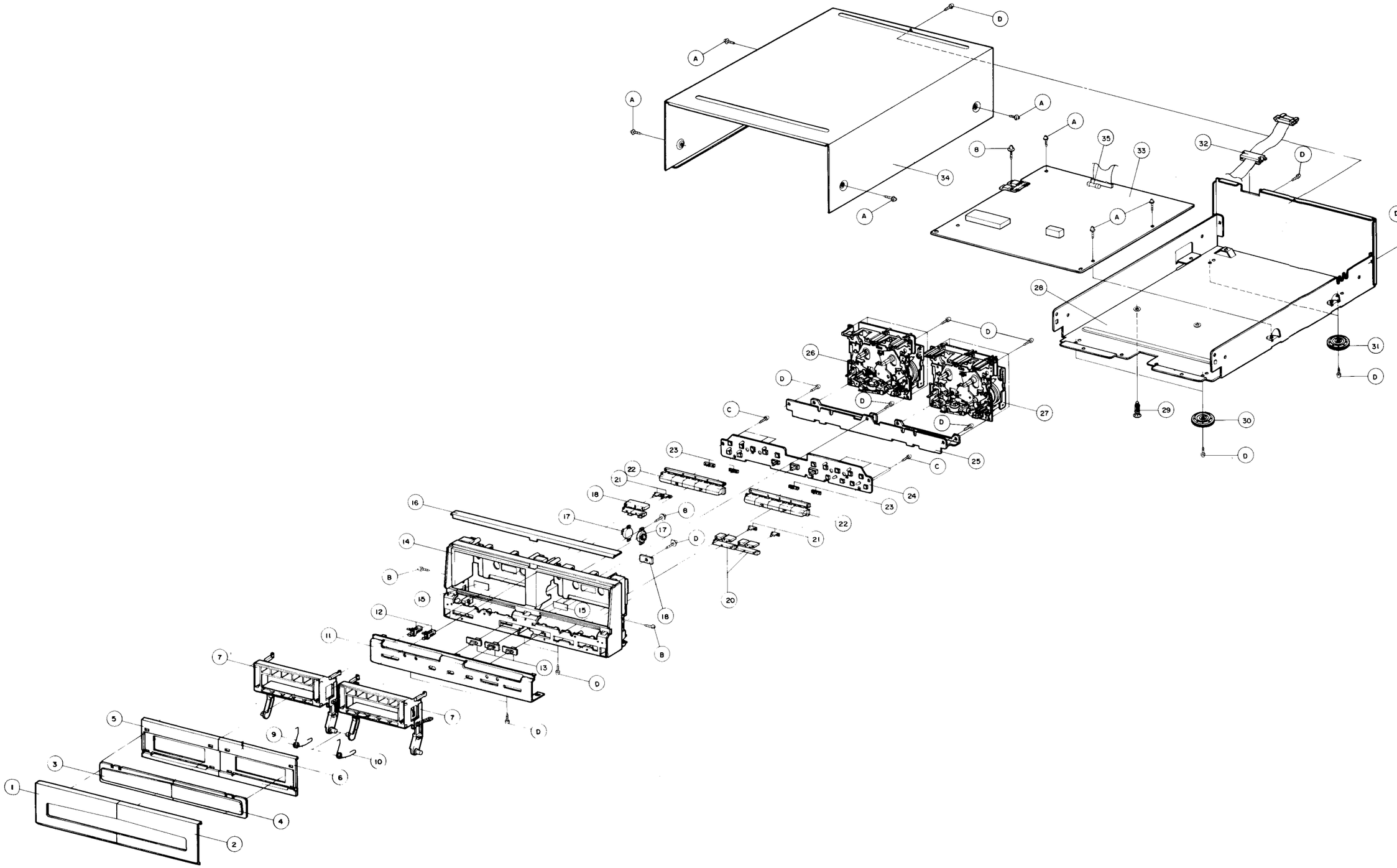
SCHEMATIC DIAGRAM



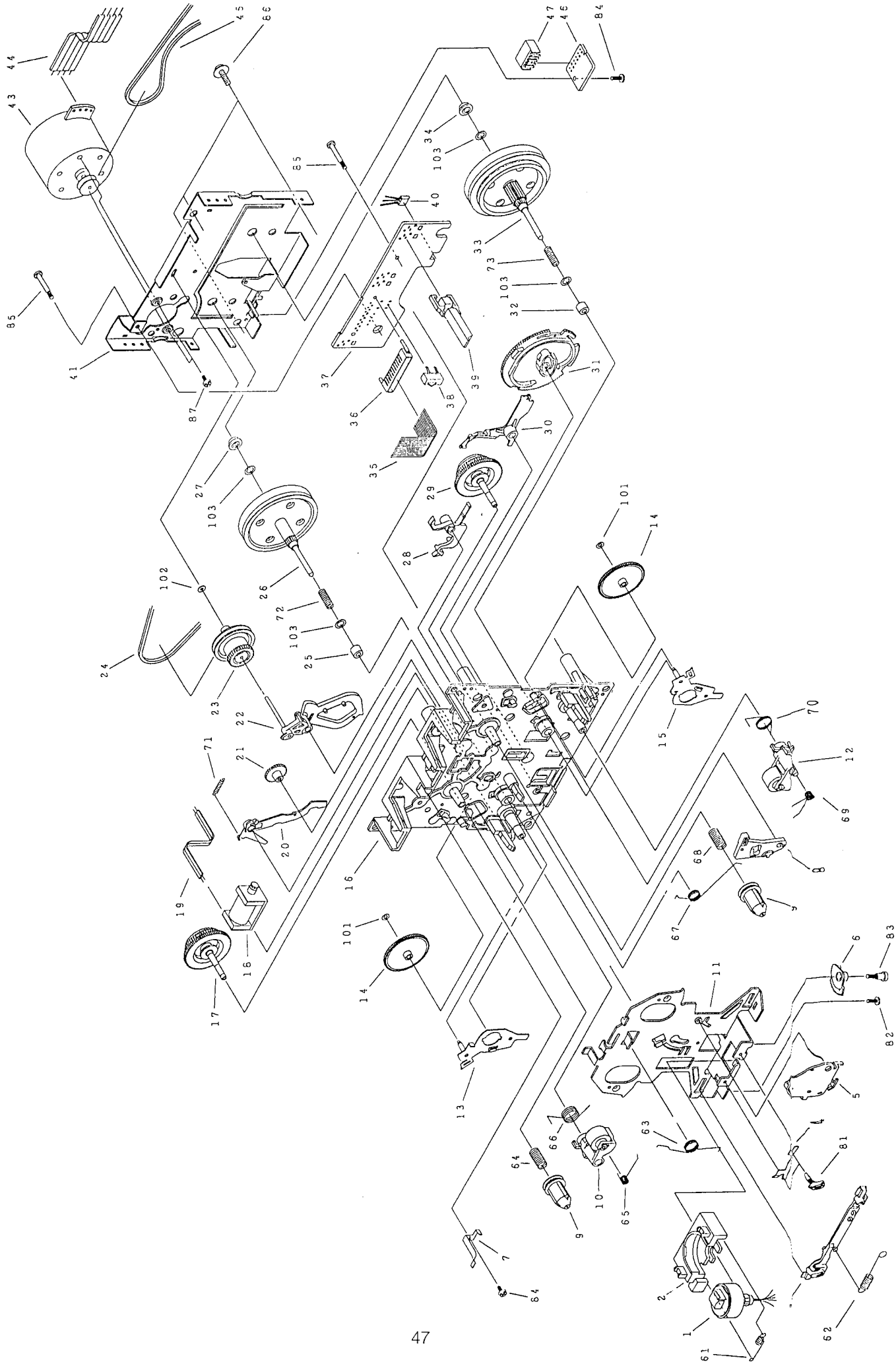
WIRING DIAGRAM



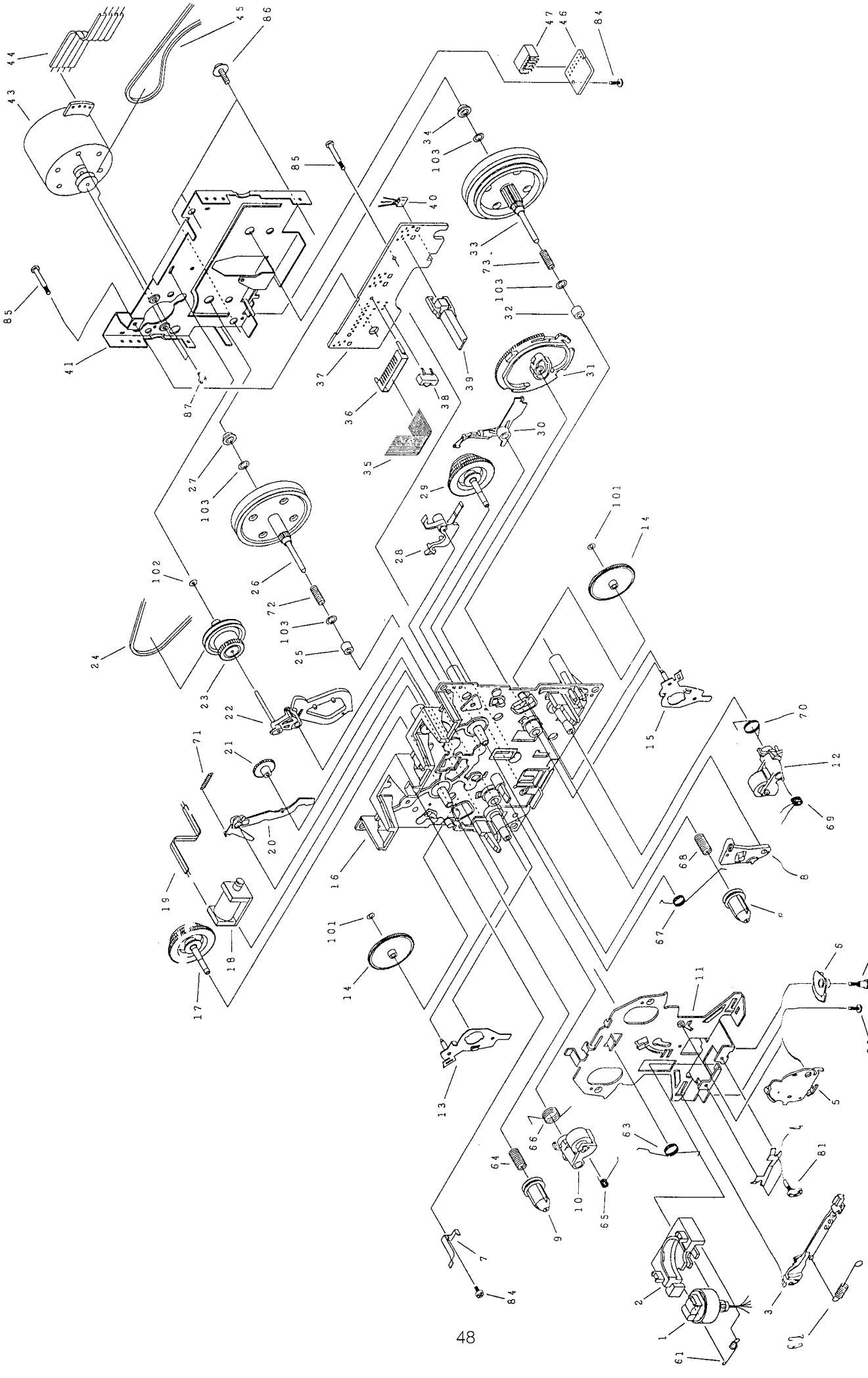
EXPLODED VIEW



EXPLODED VIEW TAPE DECK MECHANISM - A



EXPLODED VIEW TAPE DECK MECHANISM - B



ADJUSTMENTS (RS-324 TAPE DECK)

. MECHANICAL ADJUSTMENT

Tape Speed Adjustment

1. Load the TCC-112 TEST TAPE INTO DECKs A and B.
2. Put DECK A into (normal speed) PLAY state, and adjust with VR402 so that the frequency of it becomes 3000 Hz ± 5 Hz.
3. Stop DECK A operation and connect TP3 to Chassis (GND) with the deck in (normal speed) PLAY mode. Then switch DECK A into the (double-speed) PLAY state and adjust with VR401 so that frequency of it becomes 6000 Hz ± 30 Hz.
4. After releasing the short circuit mentioned in step 3, put the DECK B into (normal speed) PLAY state, and adjust with VR404 so that frequency of it becomes 3000 Hz ± 5 Hz.
5. Connect TP7 to Chassis (GND). Then switch DECK B into the (double-speed) PLAY state and adjust with VR403 so that the frequency of it becomes 6000 Hz ± 30 Hz.

. ELECTRICAL ADJUSTMENTS

Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Allow the deck to age for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0dbv = 1 Vrms.
5. Unless otherwise specified, the switch of DOLBY NR. is left in the position of OFF.

Test Tape

TCC-130: Playback adjustments (Dolby level)
TCC-154: Azimuth adjustment (or MTT-114N)
AC-224: Normal blank tape
AC-513: CrO2 blank tape
AC-712: METAL blank tape
C-60: Blank tape
TCC-161: Playback frequency tape (120 μsec)

DECK A and B (PLAYBACK SECTION)

1. Head Azimuth Adjustment
* Turn VR 101,201 (DECK A) or VR 102,202 (DECK B) to mechanical center positions.

NO	MODE	INPUT SIGNAL & TEST TAPE	ADJUSTMENT LOCATION	MEASURING LOCATION	ADJUSTMENT VALUE
1	PLAY	Play the 10KHz with TCC-154 OR MTT-114N	Head azimuth adjustment screw (Front)	LINE OUT	Maximum playback signal level.
2	STOP	Lock the screw with SCREW LOCK after completing adjustment.			

2. Playback Level Adjustment
* This adjustment determines the DOLBY NR level , and must be performed with great care.

NO	MODE	INPUT SIGNAL & TEST TAPE	ADJUSTMENT LOCATION		MEASURING LOCATION	ADJUSTMENT VALUE
1	PLAY	TCC-130 (400Hz , 0dB)	DECK A	VR 101 (L-CH) VR 201 (R-CH)	TP1 (L - CH) TP2 (R - CH)	300mV (-10.45dBv)
			DECK B	VR 102 (L-CH) VR 202 (R-CH)		

3. Playback Frequency Response Check

NO	MODE	INPUT SIGNAL & TEST TAPE	ADJUSTMENT LOCATION	MEASURING LOCATION	ADJUSTMENT VALUE
1	PLAY	TCC-161	————	LINE OUT	250Hz-10KHz ±1.5dB 10kHZ-12.5KHZ±2.5dB

4. Playback Noise Confirm

1	PLAY	C - 60		LINE OUT	Less than 2mV

DECK B (RECORDING SECTION)

1. Recording Level Adjustment

NO	MODE	INPUT SIGNAL & TEST TAPE	ADJUSTMENT LOCATION	MEASURING LOCATION	ADJUSTMENT VALUE
1	STOP	AC-224, AC - 513, AC-712			
2	REC/ PAUSE	Apply a 400Hz signal to LINE IN.		TP1 TP2	100 mV (- 20dBv)
3	REC/ PLAY	Record the above signal onto the AC-224 test tape,and playback.	VR 151 (L - CH) VR 251 (R - CH)	LINE OUT	100 mV (- 20dBv)
4	Load the AC-513 and AC-712 test tape into DECK B , and repeat steps 2 and 3.				

2. Recording Bias Adjustment

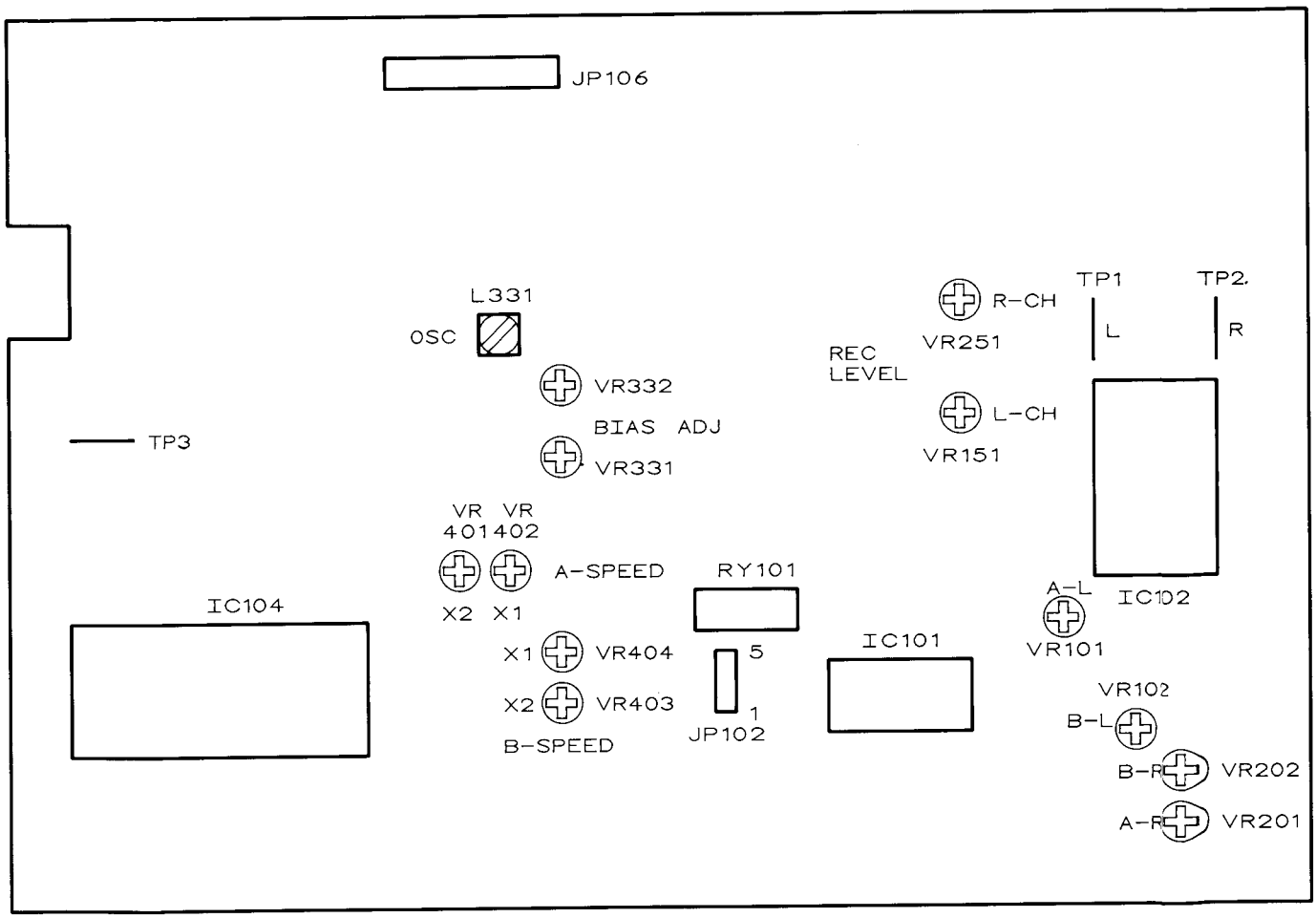
NO	MODE	INPUT SIGNAL & TEST TAPE	ADJUSTMENT LOCATION	MEASURING LOCATION	ADJUSTMENT VALUE
1	STOP	AC - 224			
2	REC/ PAUSE	Apply a 10KHz / -30 dBv signal to LINE IN.		LINE OUT	31.6mV (- 30dBv)
3	REC/ PLAY	Record the above signal onto the AC - 224 test tape, and playback.	VR 331 (L - CH) VR 332 (R - CH)	LINE OUT	31.6mV (- 30dBv)

3. Recording and Playback Frequency Response Check

1	STOP	AC-224, AC-513, AC-712			
2	REC/ PLAY	40-15000Hz/31.6mV(-30dBv)	CONFIRM	LINE OUT	31.6mV (- 30dBv)

4. Bias OSC. Frequency Adjustment

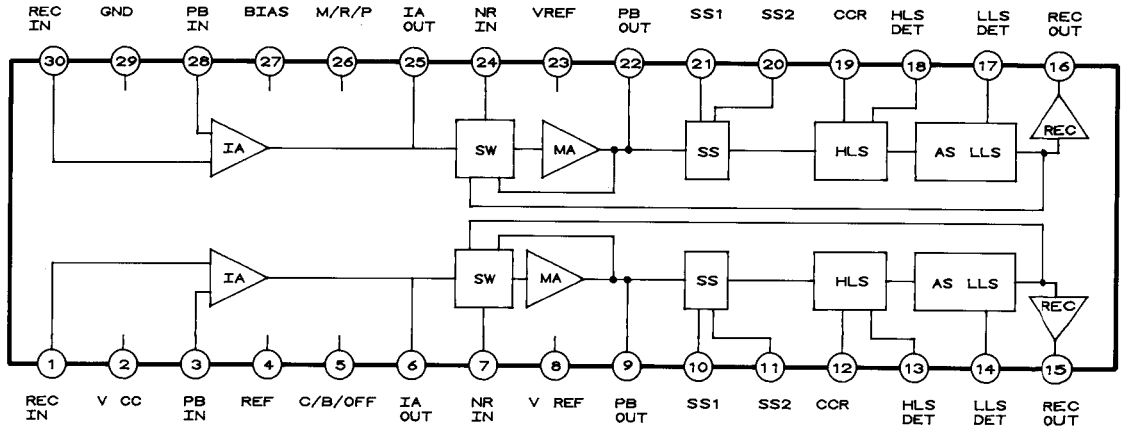
1	STOP	TCC-712			
2	REC/ PLAY	TCC-712	L331	ERASE HEAD (1PIN and 2PIN of WA 102)	105KHz



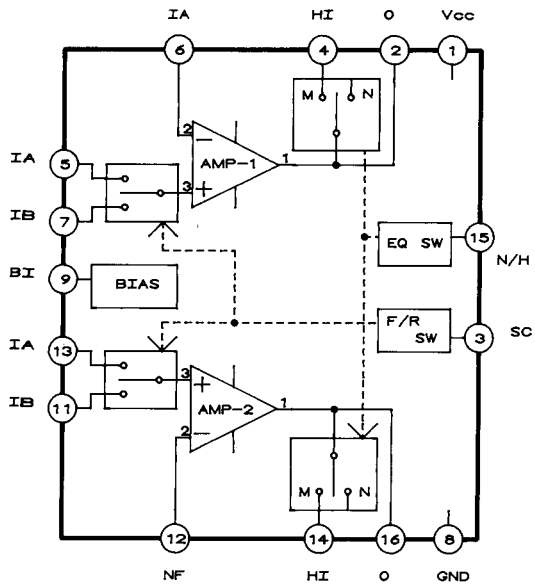
RS-324 DECK ADJUSTMENT

I.C. BLOCK DIAGRAM

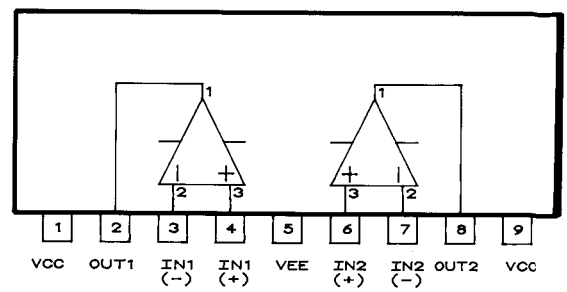
IC102
HA12142NT



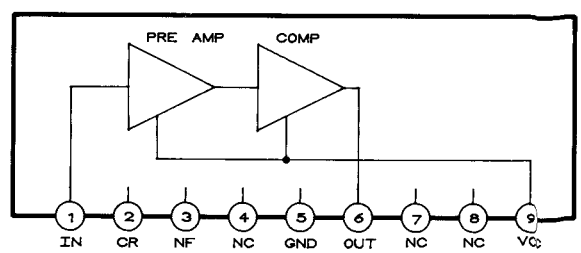
IC101
DBL1045



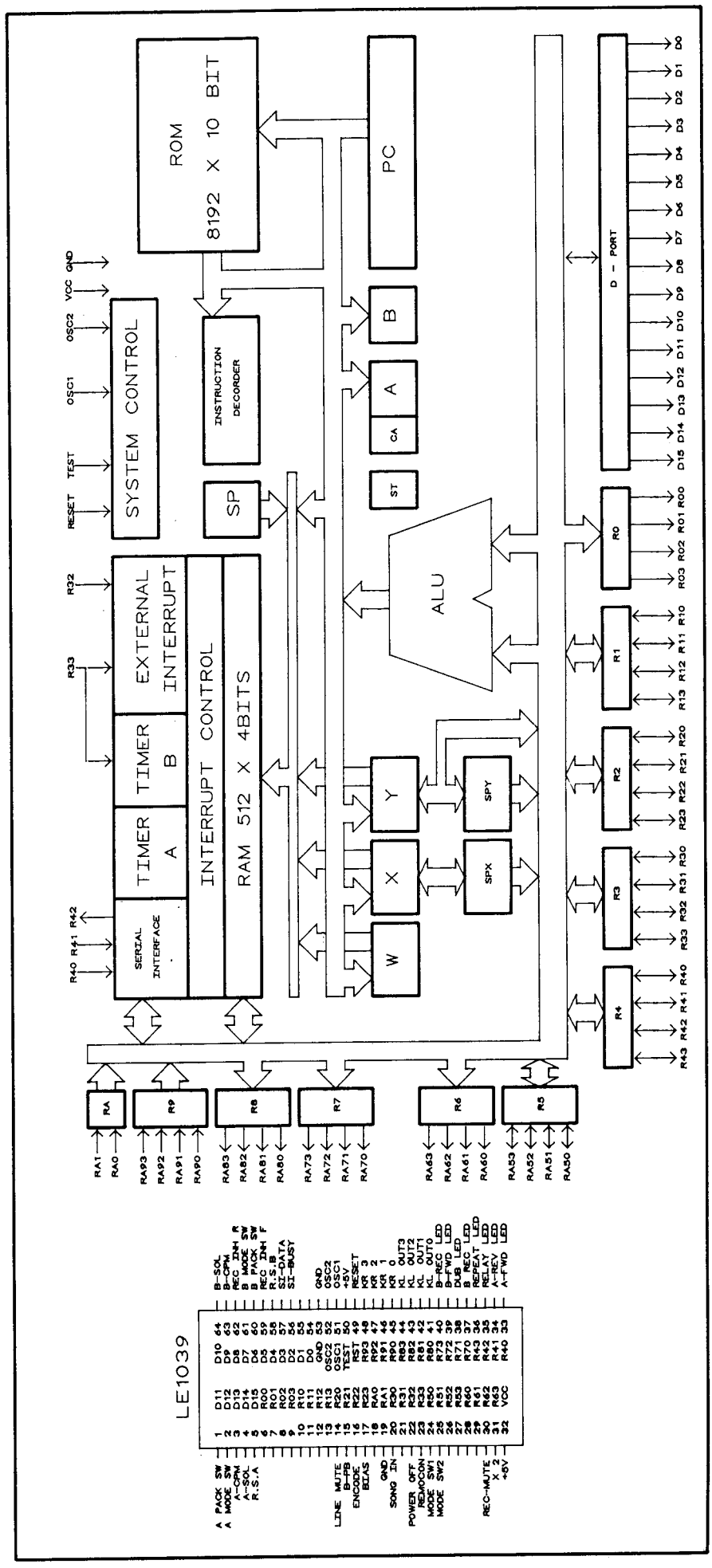
IC103
MC4558S OR KA4558S



IC105
LA-2000



IC104
LE1039



LIST OF I.C. VOLTAGE

IC101
DBL1045 TERMINAL FUNCTION

Pin No.	TerminalSymbol	DC VOLTAGE	Terminal Function
1	Vcc	12.2 V	CONNECTED 12 V
2	O	2.3 V	PB L-CH OUTPUT
3	SC	4.2 V	THE A AND B SIGNAL SELECTION A: 4.4 V , B: 0 V
4	HI	2.3 V	METAL EQ INPUT (70 uS)
5	IA	3 V	THE SIGNAL INPUT OF DECK A
6	NF	3 V	NEGATIVE FEEDBACK INPUT
7	IB	3 V	THE SIGNAL INPUT OF DECK B
8	GND	0 V	CONNECTED GROUND
9	BI	3 V	BIAS
10	NC		
11	IB	3 V	THE SIGNAL INPUT OF DECK B
12	NF	3 V	NEGATIVE FEEDBACK INPUT
13	IA	3 V	TEH SIGNAL INPUT OF DECK A
14	HI	2.3 V	METAL EQ INPUT (70 uS)
15	N/H	3.8 V	THE METAL AND THE NORMAL SELECTION SWITCH
16	O	2.3 V	PB R-CH OUTPUT

* CONDITION : NOT INSERT THE TAPE AT THE CASSETTE HOLDER.

IC102
HA-12142NT TERMINAL FUNCTION

Pin No.	TerminalSymbol	DC VOLTAGE	TERMINAL DESCRIPTION
1	REC IN	5.8 V	RECORDING INPUT
30			
2	VCC	11.6 V	POWER SUPPLY
3	PB IN	5.8 V	PLAYBACK INPUT
28			
4	REF	1.4 V	RIPPLE FILTER
5	C/B/OFF	10.5V - 1.4V	MODE CONTROL PIN FOR NR. C:10.5V , B:6V , NR OFF: 1.4V
6	IA OUT	5.8 V	INPUT AMP OUTPUT
25			
7	NR IN	5.8 V	NR PROCESSOR INPUT
24			
8	VREF	5.8 V	REFERANCE VOLTAGE OUTPUT
23			
9	PB OUT	5.8 V	PLAYBACK (DECODE) OUTPUT
22			
10	SS1	5.8 V	SPECTRAL SKEWING AMP INPUT
21			
11	SS2	5.8 V	SPECTRAL SKEWING AMP OUTPUT
20			
12	CCR	5.8 V	CURRENT CONTROLED RESISTOR OUTPUT
19			

Pin No.	TerminalSymbol	DC VOLTAGE	TERMINAL DESCRIPTION
13	HLS DET	2.0 V	TIME CONSTANT PIN FOR RECTIFIER
18			
14	LLC DET		
17			
15	REC OUT	5.8 V	RECORDING (ENCODE) OUTPUT
16			
26	M/R/P	0.7 V	MODE CONTROL PIN FOR REC/PB. REC MPX OFF:H , REC MPX ON:M , PB:L
27	BIAS	0.2 V	REFERENCE CURRENT INPUT
29	GND	0 V	GROUND

* CONDITION : NO SIGNAL,DOLBY OFF

IC104
LE-1039 TERMINAL FUNCTION

PIN NO	PORT NAME	I/O	ACTIVE	FUNCTION NAME	FUNCTION
1	D11	I	L	A PACK SW	MECHANISM A PACK SWITCH INPUT
2	D12	I	L	A MODE SW	MECHANISM A MODE SWITCH INPUT
3	D13	O	H	A-CPM	DECK A CAPSTAN MOTOR CONTROL OUTPUT
4	D14	O	H	A-SOL	DECK A SOLENOID CONTROL OUTPUT
5	D15	I	H/L	R.S.A	MECHANISM A ROTATION DETECTION SENSOR INPUT
6	RO0	I/O	NC		
7	RO1	I/O	NC		
8	RO2	I/O	NC		
9	RO3	I/O	NC		
10	R10	I/O	NC		
11	R11	I/O	NC		
12	R12	I/O	NC		
13	R13	I/O	NC		
14	R20	O	H	LINE MUTE	LINE OUTPUT MUTE CONTROL
15	R21	O	H	B-PB	PLAYBACK EQ A/B SELECTION A:L , B:H
16	R22	O	L	ENCODE	DOLBY IC ENCODE/DECODE SELECTION , RECORD MODE : L
17	R23	O	H	BIAS	DECK B BIAS ON/OFF
18	RA0	I	NC		
19	RA1	I		GND	CONNECTED TO GND
20	R30	I	H	SONG IN	MUSIC SEARCH INPUT, SONG DETECTION : H
21	R31	I/O	NC		
22	R32	I	L	POWER OFF	SYSTEM POWER ON/OFF INPUT, POWER ON : H ,POWER OFF :L
23	R33	I	L	REMOCON	REMOTE CONTROL INPUT
24	R50	I	L/H	MODE1 SW	DECK REVERSE MODE SELECTION INPUT
25	R51	I	L/H	MODE2 SW	DECK REVERSE MODE SELECTION INPUT
26	R52	I	L/H	TIMER SW	TIMER REC INPUT TIMER REC ON: H
27	R53	I/O	NC	B DECK PACK	MECHANISM B PACK SWITCH INPUT
28	R60	O	NC		
29	R61	O	NC		
30	R62	O	L	REC MUTE	REC MUTE CONTROL OUTPUT
31	R63	O	L	X2	DECK HIGH SPEED CONTROL
32	VCC	POWER		VCC	CONNECTED +5 V
33	R40	O	L	A FWD LED	DECK A FWD PLAY LED CONTROL OUTPUT
34	R41	O	L	A RVS LED	DECK A RVS PLAY LED CONTROL OUTPUT
35	R42	O	L	RELAY LED	RELAY LED CONTROL OUTPUT
36	R43	O	L	REPEAT LED	REPEAT LED CONTROL OUTPUT
37	R70	O	L	B REC LED	DECK B REC LED CONTROL OUTPUT

PIN NO	PORT NAME	I/O	ACTIVE	FUNCTION NAME	FUNCTION
38	R71	O	L	DUB LED	DUBBING LED CONTROL OUTPUT
39	R72	O	L	B FWD LED	DECK B FWD PLAY LED CONTROL OUTPUT
40	R73	O	H	B RVS LED	DECK B RVS PLAY LED CONTROL OUTPUT
41	R80	O	L	KL OUT0	KEY CONTROL SCAN OUTPUT
42	R81	O	L	KL OUT1	
43	R82	O	L	KL OUT2	
44	R83	O	L	KL OUT3	
45	R90	I	L	KR0	KEY CONTROL SCAN INPUT
46	R91	I	L	KR1	
47	R92	I	L	KR2	
48	R93	I	L	KR3	
49	RST	I	H	RESET	RESET INPUT
50	TEST	I	H	TEST	CONNECTED +5 V
51	OSC1	I		OSC1	CERAMIC OSC CONNECTION PIN FREQ.= 4MHz
52	OSC2	O		OSC2	
53	GND	POWER		GND	CONNECTED GND
54	D0	O	NC		
55	D1	O	NC		
56	D2	I/O	L	SI-BUSY	CONTROL SIGNAL BUSY INPUT/OUTPUT
57	D3	I/O	L	SI-DATA	CONTROL SIGNAL DATA INPUT/OUTPUT
58	D4	I	L/H	R.S.B	MECHANISM B ROTATION DETECTION SENSOR INPUT
59	D5	I	L	REC-INH F	B DECK FWD REC INHIBIT DETECTION INPUT
60	D6	I	L	B-PACK SW	B DECK PACK SW INPUT
61	D7	I	L	B-MODE SW	B DECK PLAY MODE SW INPUT
62	D8	I	L	REC-INH R	B DECK RVS REC INHIBIT DETECTION INPUT
63	D9	O	H	B CPM	DECK B CAPSTAN MOTOR CONTROL
64	D10	O	H	B SOL	DECK A SOLENOID CONTROL OUTPUT

IC105

LA-2000 TERMINAL FUNCTION

Pin No.	TerminalSymbol	DC VOLTAGE	TERMINAL DESCRIPTION
1	IN	2 V	SIGNAL INPUT PIN
2	CR	0 V	FOR DESIGNATION OF TIME DELAYS
3	NF	2 V	NF PIN
4	NC		
5	GND	0 V	CONNECTED THE GROUND
6	OUT	0 V	OUTPUT OF THE MUSIC SEARCH
7	NC		
8	NC		
9	Vcc	12.8V	VCC

* CONDITION : NO SIGNAL

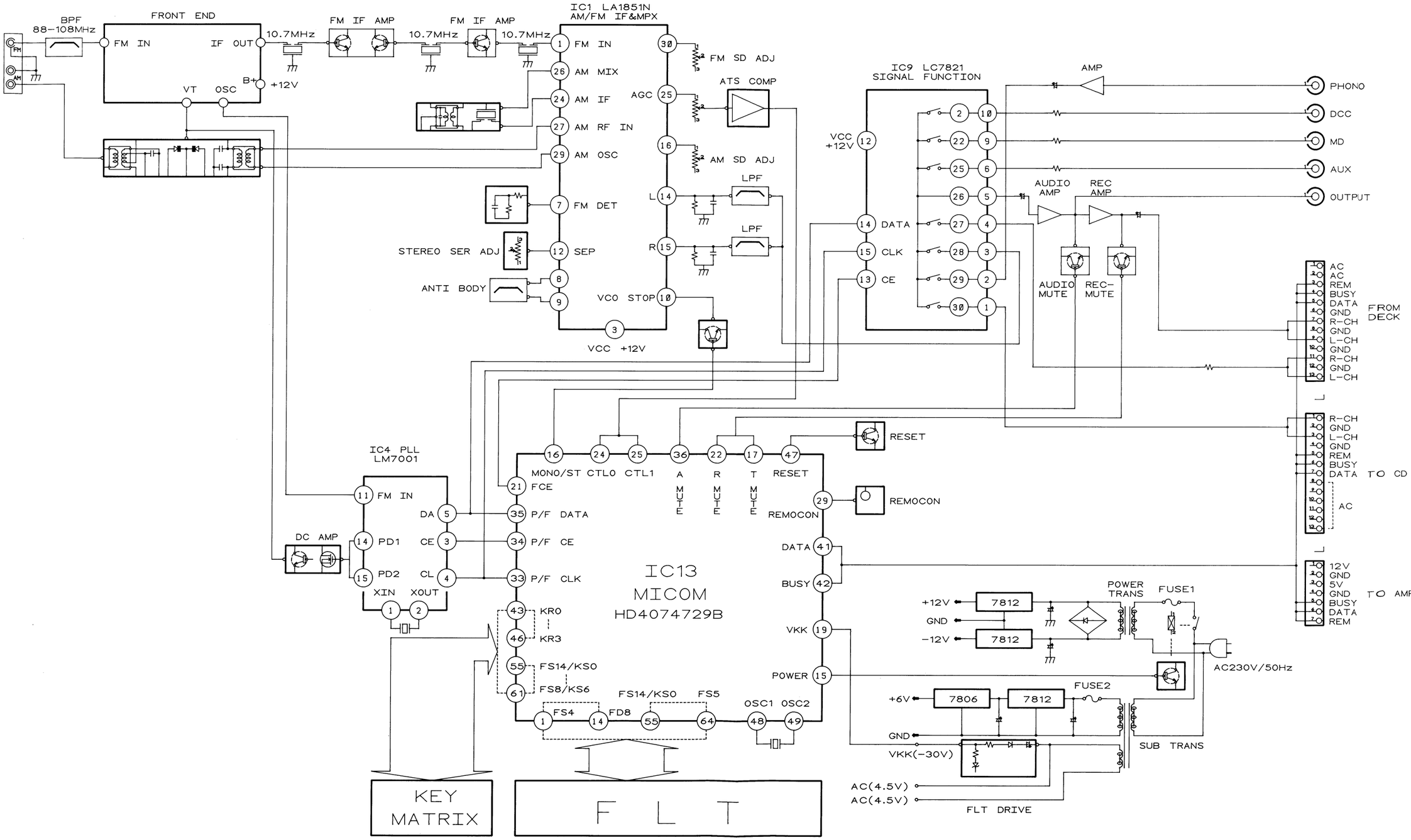
TUNER PART

SPECIFICATIONS

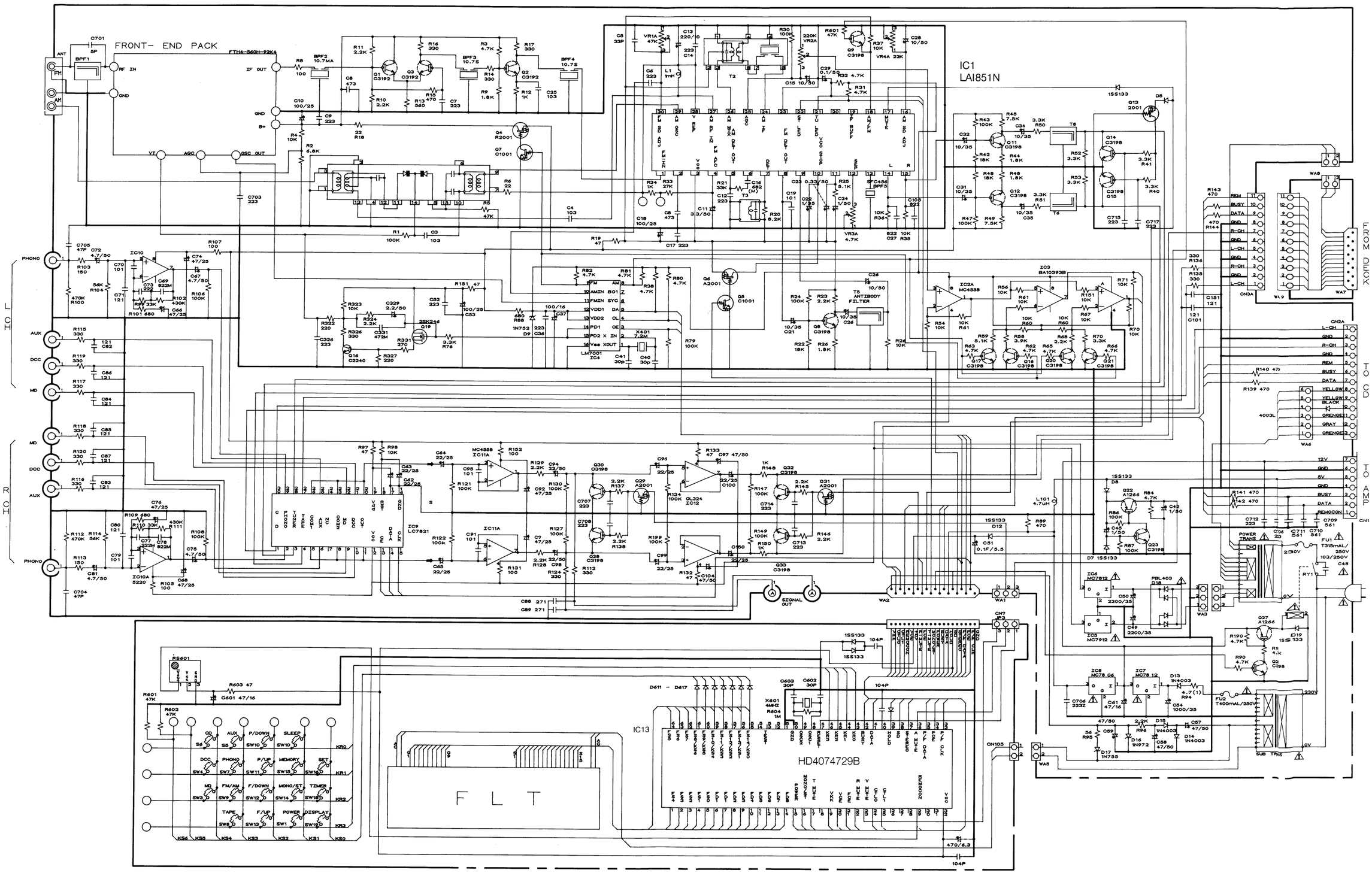
FORMAT

Power Supply	230V/50Hz
Frequency Range	FM : 87.5 ~ 108 MHz
	MW : 531 ~ 1602 KHz
Tuning Step	FM : 50 KHz
	MW : 9 kHz
Intermediate Frequency	FM : 10.7 ± 0.1 MHz
	MW : 450KHz
Sensitivity	FM : 3 dB (26dB,40KHz)
	MW : 400 μV/m (20dB)
Selectivity	FM : 60 dB (±300KHz)
	MW : 33 dB (±9KHz)
IF-Rejection	FM : 80 dB (98MHz)
	MW : 47 dB (999KHz)
Image Rejection	FM : 80 dB (98MHz)
	MW : 30 dB (999KHz)
Signal-to-Noise Ratio	FM 70 dB
	MW 40 dB
Distortion	FM 0.2 %
	MW 0.5 %
Phono Frequency Response	± 1.5 dB(30 Hz~15 KHz)
Frequency	FM 〈20 ··· 〈15 KHz(±1.5dB)
Output Level	FM : 380 mV (40KHz DEV,1KHz)
	MW : 150 mV(30% Mod. 400Hz)
Crosstalk PHONO → AUX 100Hz	75 dB
10KHz	75 dB
AUX → PHONO 100Hz	75 dB
10KHz	75 dB
Seperation	40 dB(1KHz)
Power Comsumption	14 Watts
Dimensions	270(W) * 85(H) * 340(D)
Weight(Net)	4.35 Kg

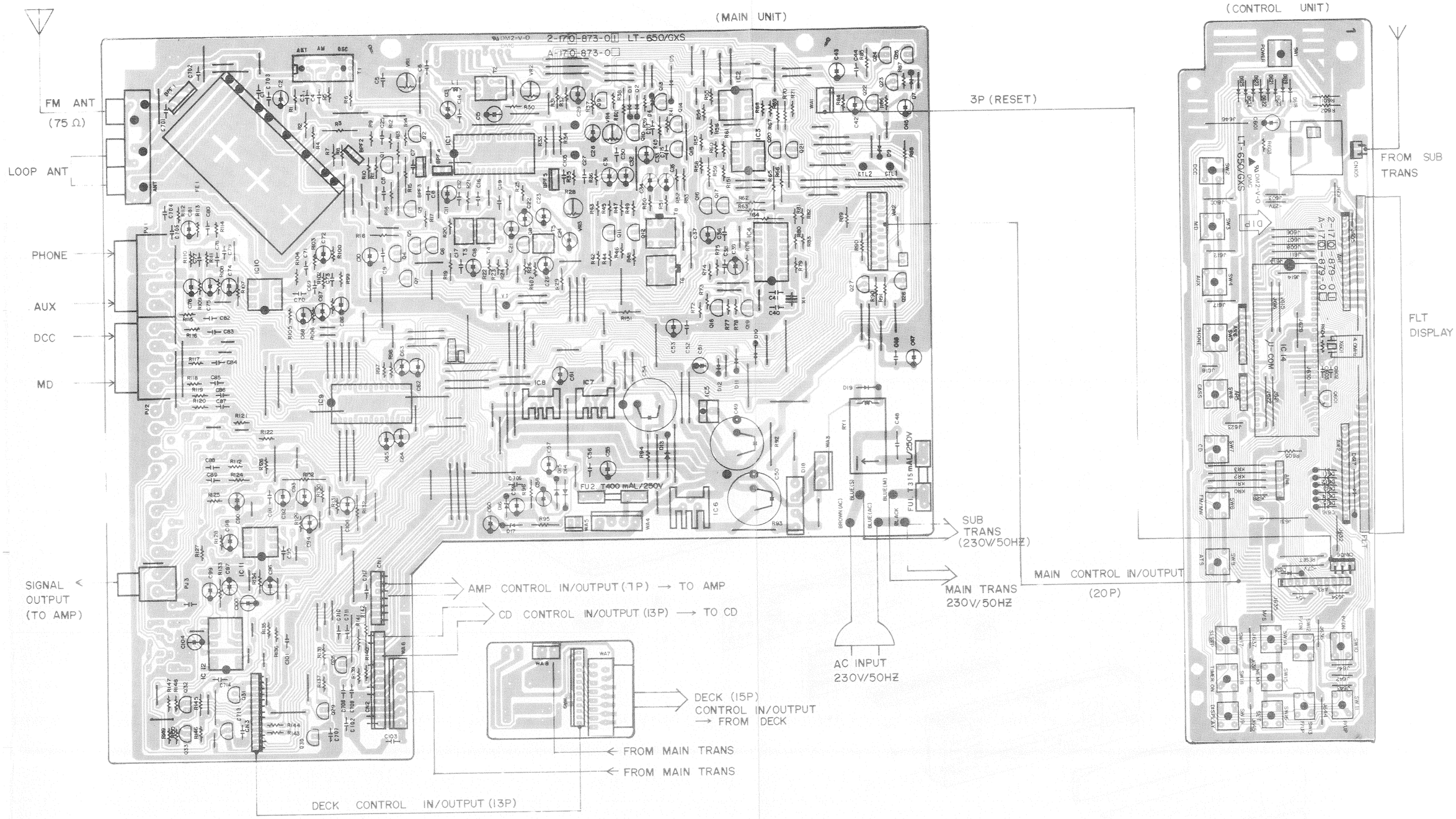
BLOCK DIAGRAM < FD7311



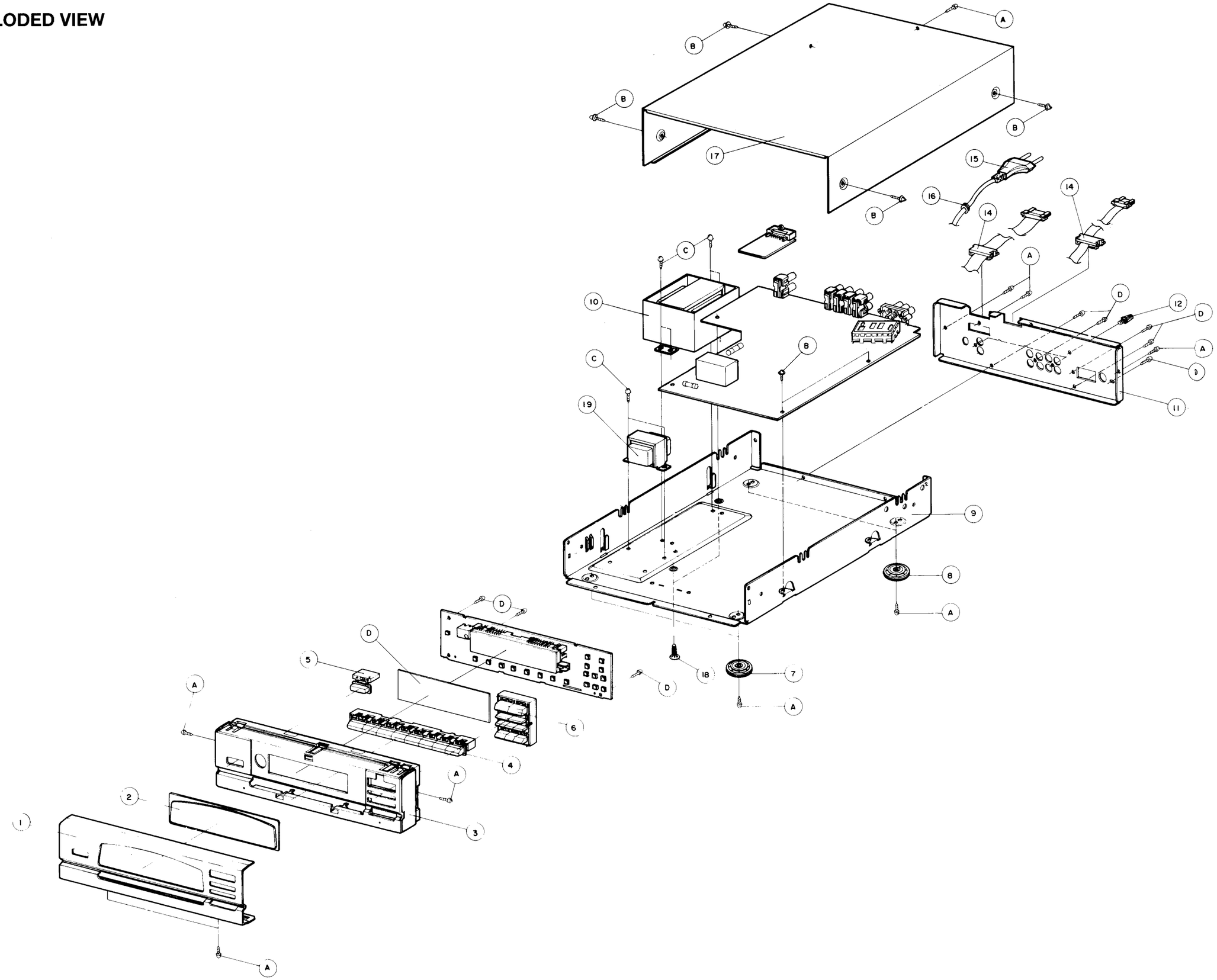
SCHEMATIC DIAGRAM < FD7311



WIRING DIAGRAM < FD7311



EXPLODED VIEW



ADJUSTMENT

FM TUNER SECTION

* Connect the FM signal generator (FM SG) to the FM Antenna 75 ohm terminal through a 75 ohm dummy antenna.
* Set the RS-324T to the FM Band.

1) Tune the FM SG to the RS-324T.
2) Connect the FM multiplex stereo signal generator to the FM SG external modulation terminal. Set the modulation to main 1 KHz / L + R /±40 KHz deviation,pilot 19KHz/6KHz deviation.

Step	FM SG 1KHz,40KHz deviation		Tuner Frequency Display	Adjustment Point	Adjustment precedure
	Frequency	Level			
1	No signal		87.5 MHz		Confirm that 1.6V DC± 0.5V between terminal VT and ground.
2	No signal		108.0 MHz		Confirm that 8.3V DC± 0.5V between terminal VT and ground.
3	98 MHz	60 dB	98 MHz	TP1,TP2	Adjust until T-meter at between TP1 and TP2 could be positioned at center
4	98 MHz Set to stereo	60 dB	98 MHz	I.F (within±90)	Adjust until Distortion at output L + R Terminal is Minimum.
5	98 MHz	20 ± 5dB	98 MHz	VR 1	Adjust until Volt at between GND and AUTO is 0 V.
6	98 MHz Set to stereo	60 dB	98 MHz	VR 3	Adjust until stereo seperation at output L+R terminal is maximum
7	98 MHz	60 dB	98 MHz	VR 801	Adjust until all signal meter light up
8	98 MHz	20 dB	98 MHz	VR 2	Adjust until volt at between GND and CTL1 is 5V

4) The tuned indicator should go off within 20 KHz to 40 KHz when moving away (in either direction) from a tuned frequency.

AM TUNER

* Connect the furnished AM loop antenna between terminals AM ANTENNA and GND.
* Connect the AM signal generator (AM SG) to the Antenna terminal.

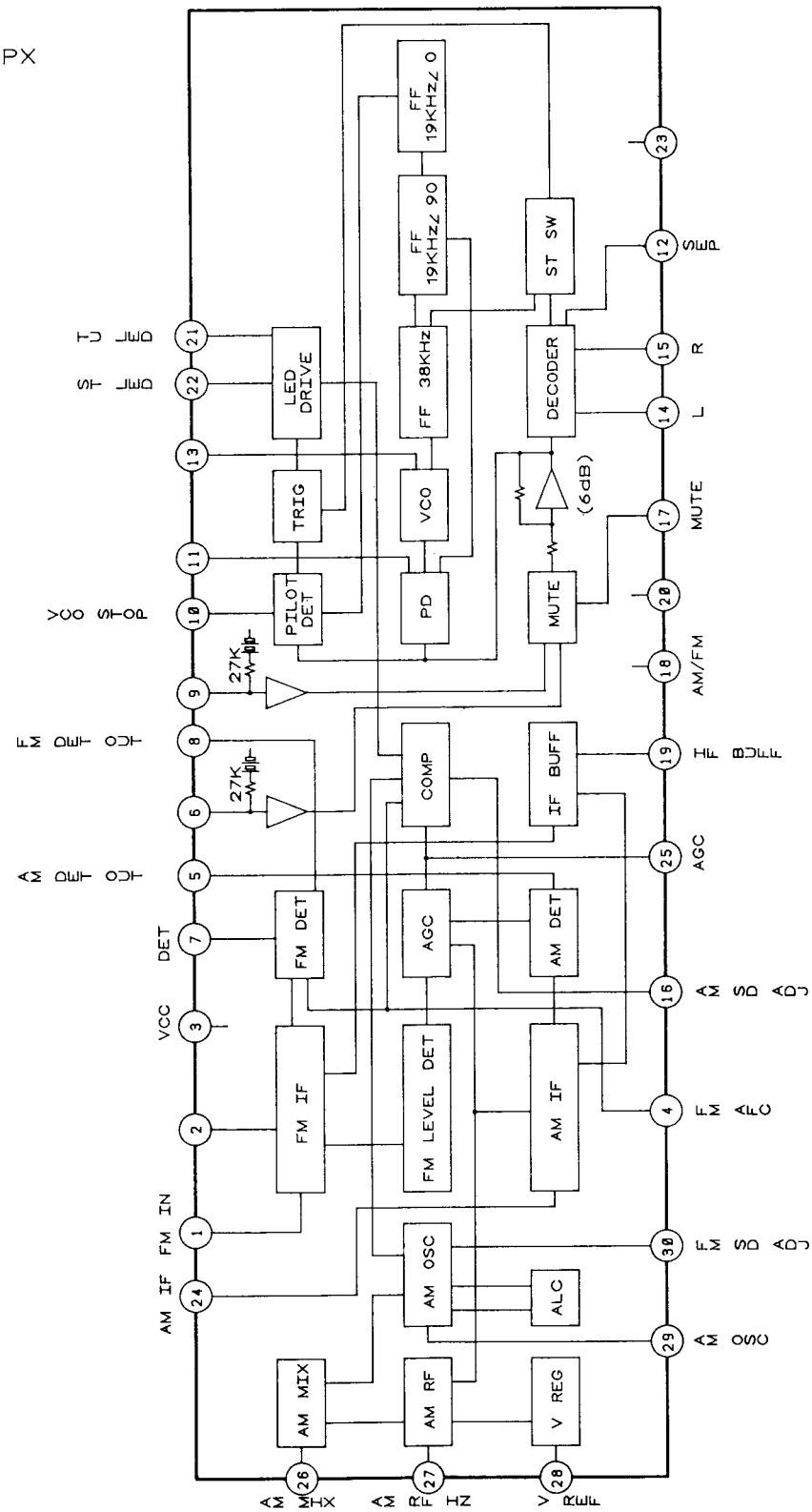
Tune the AM SG to the RS-324T

Step	AM SG 400KHz,30% deviation		Tuner Frequency Display	Adjustment Point	Adjustment precedure
	Frequency	Level			
1	No signal		531 KHz		1.2 V DC between terminal VT and GND
2	No signal		1602 KHz		7.9 V DC between terminal VT and GND
3	999 KHz	56 dB	999 KHz	VR 4	Adjust until Volt at between GND and AUTO is 0 V.

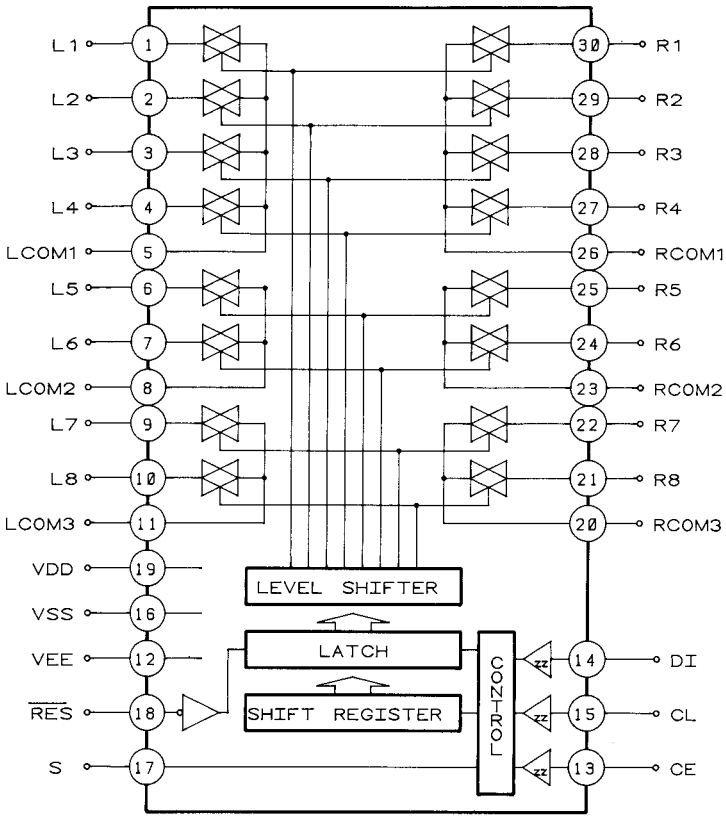
I.C. BLOCK DIAGRAM

IC1

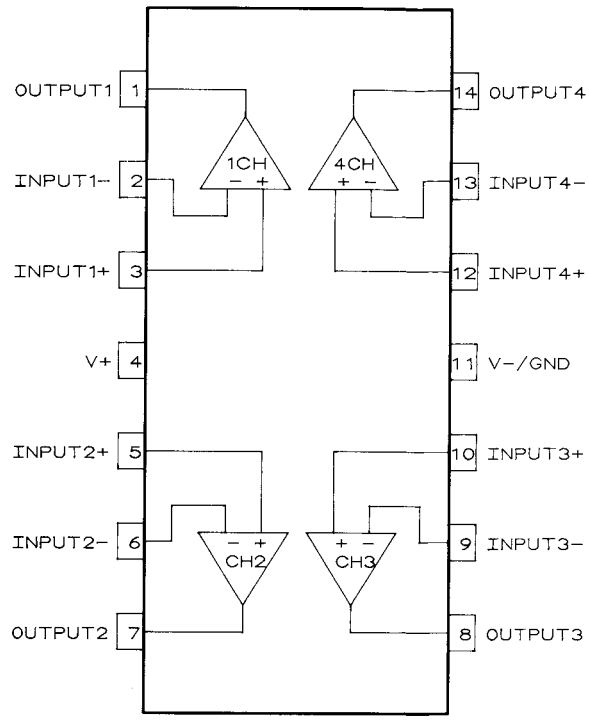
LA1851N MPX



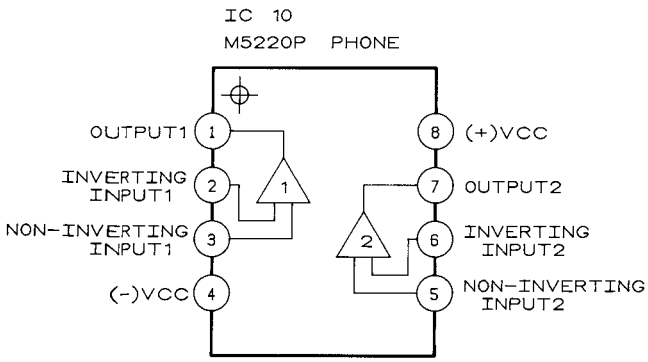
IC 9
LC7821N FUNCTION



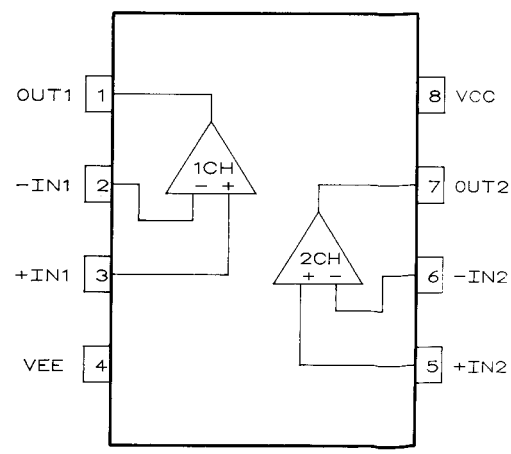
IC 12
GL324 QUAD OP AMP



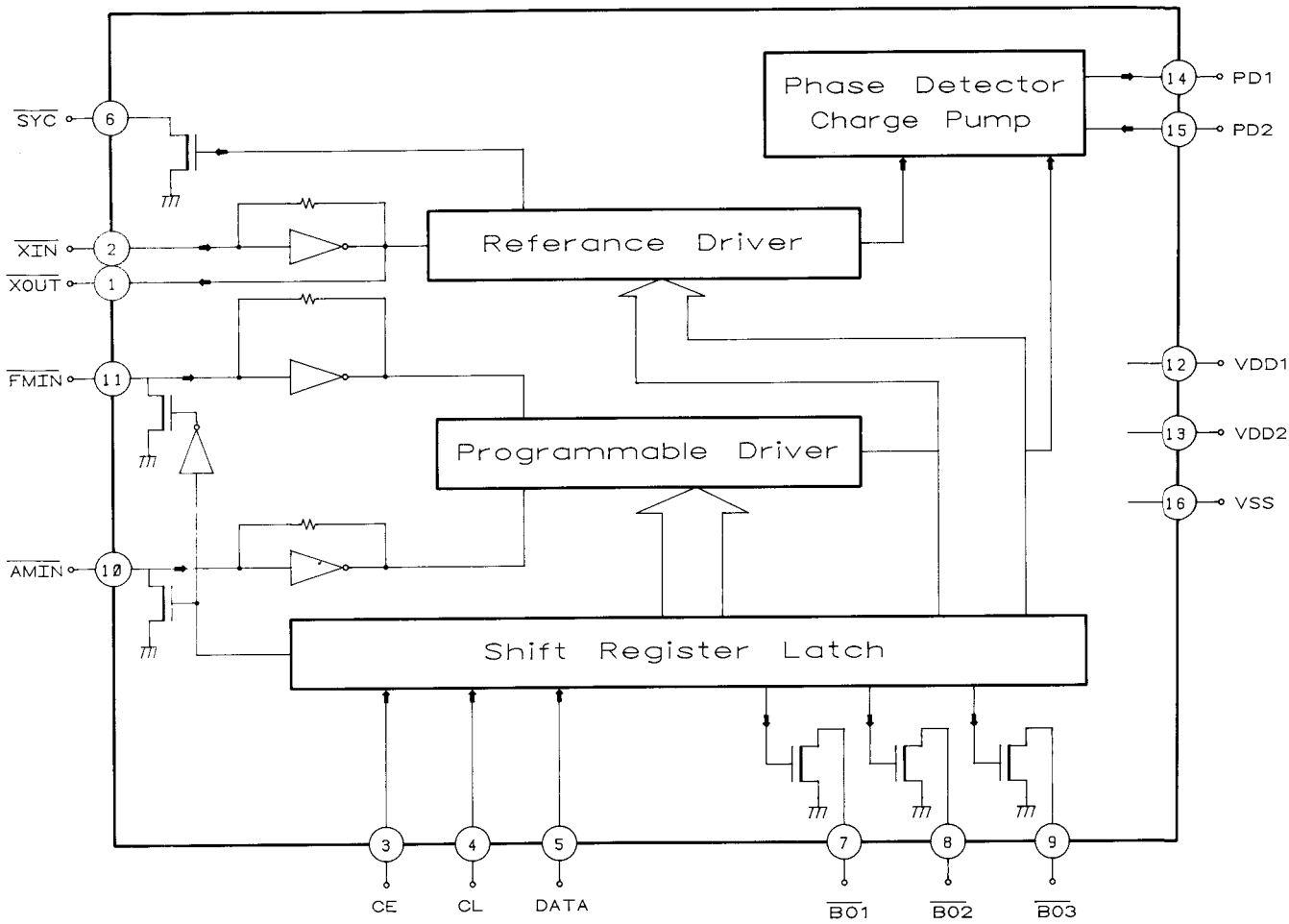
IC 10
M5220P PHONE



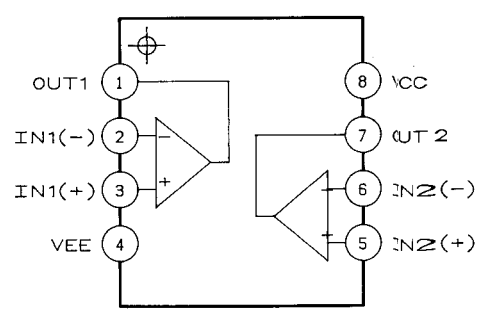
IC 3
BA10393 COMPARATOR

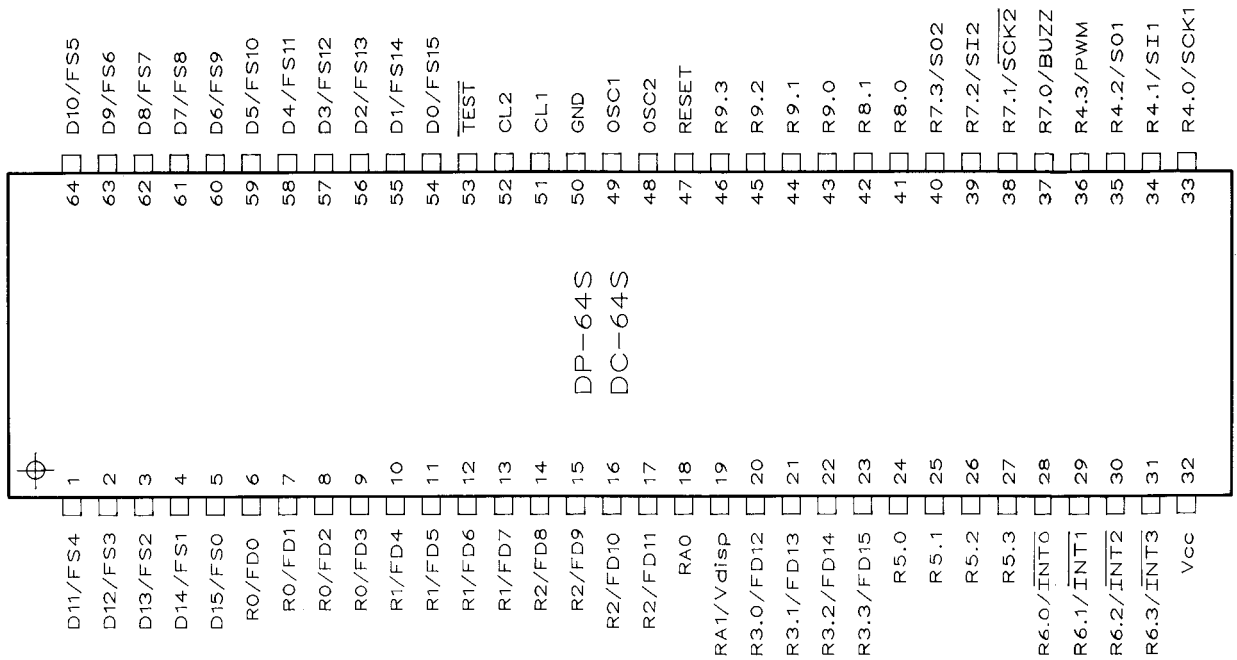


IC 4
LM7001 PLL

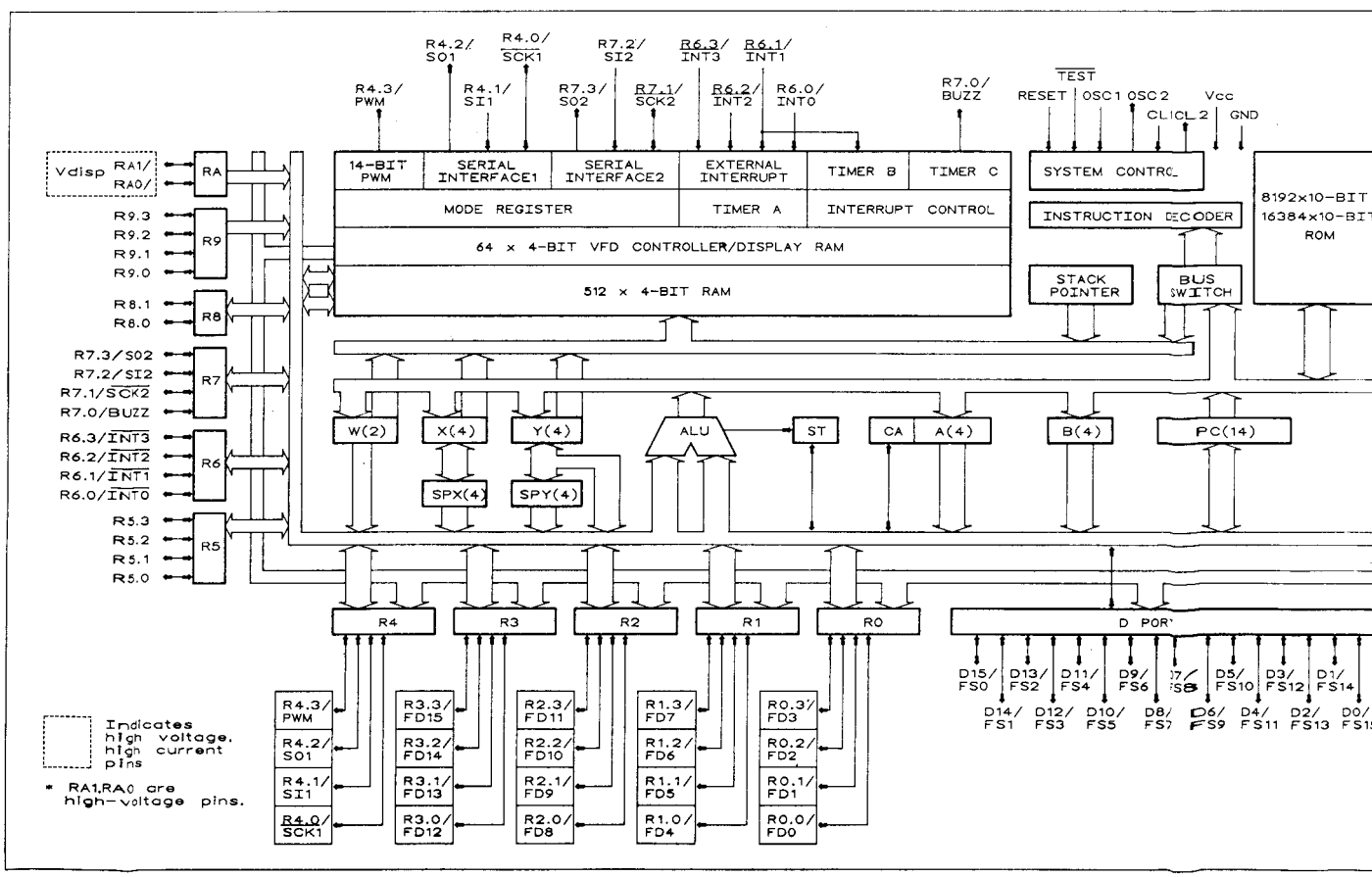


IC 2,11
KA4558 OP AMP





IC13
HD4074729B MICRO-PROCESSOR

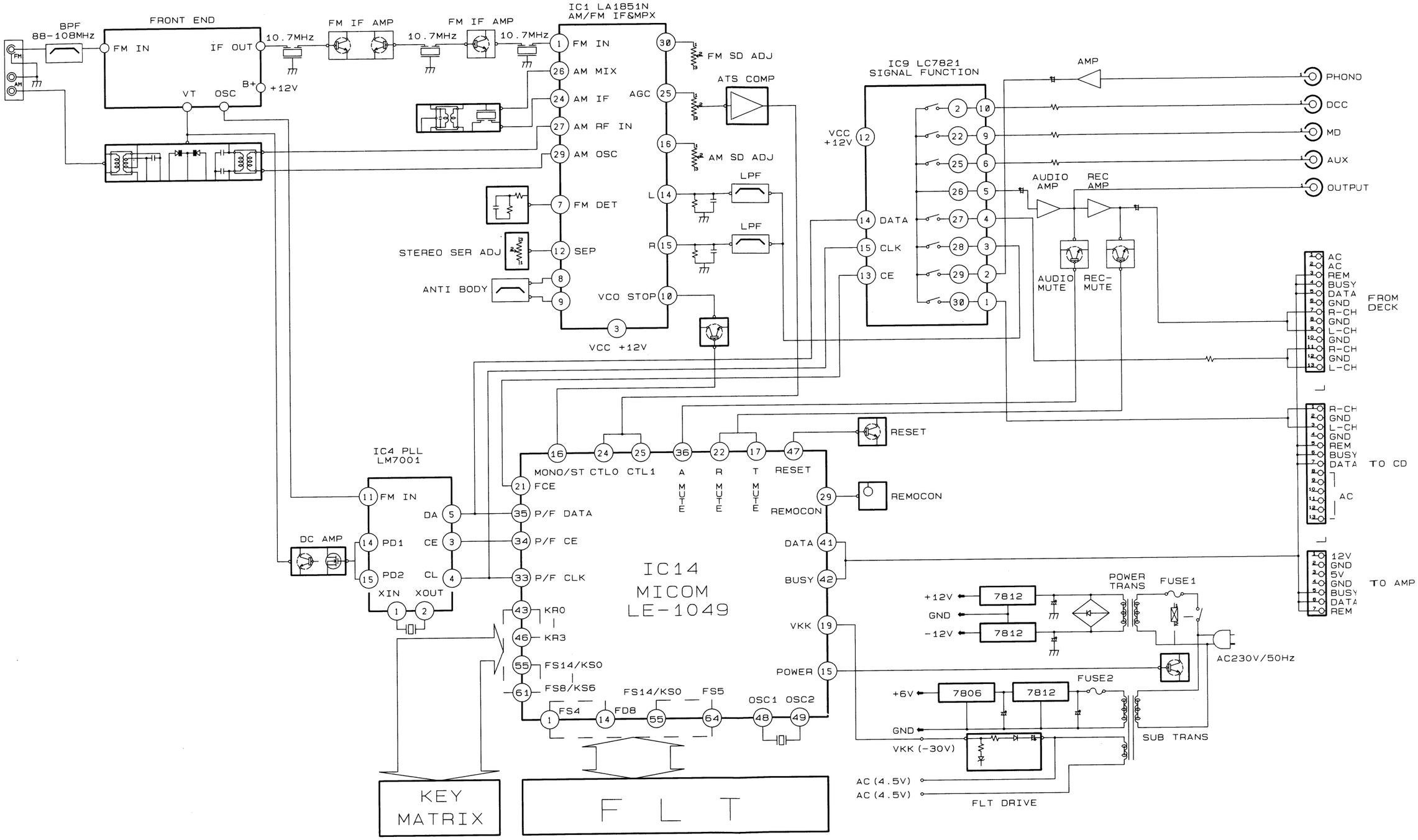


LIST OF I.C. VOLTAGE

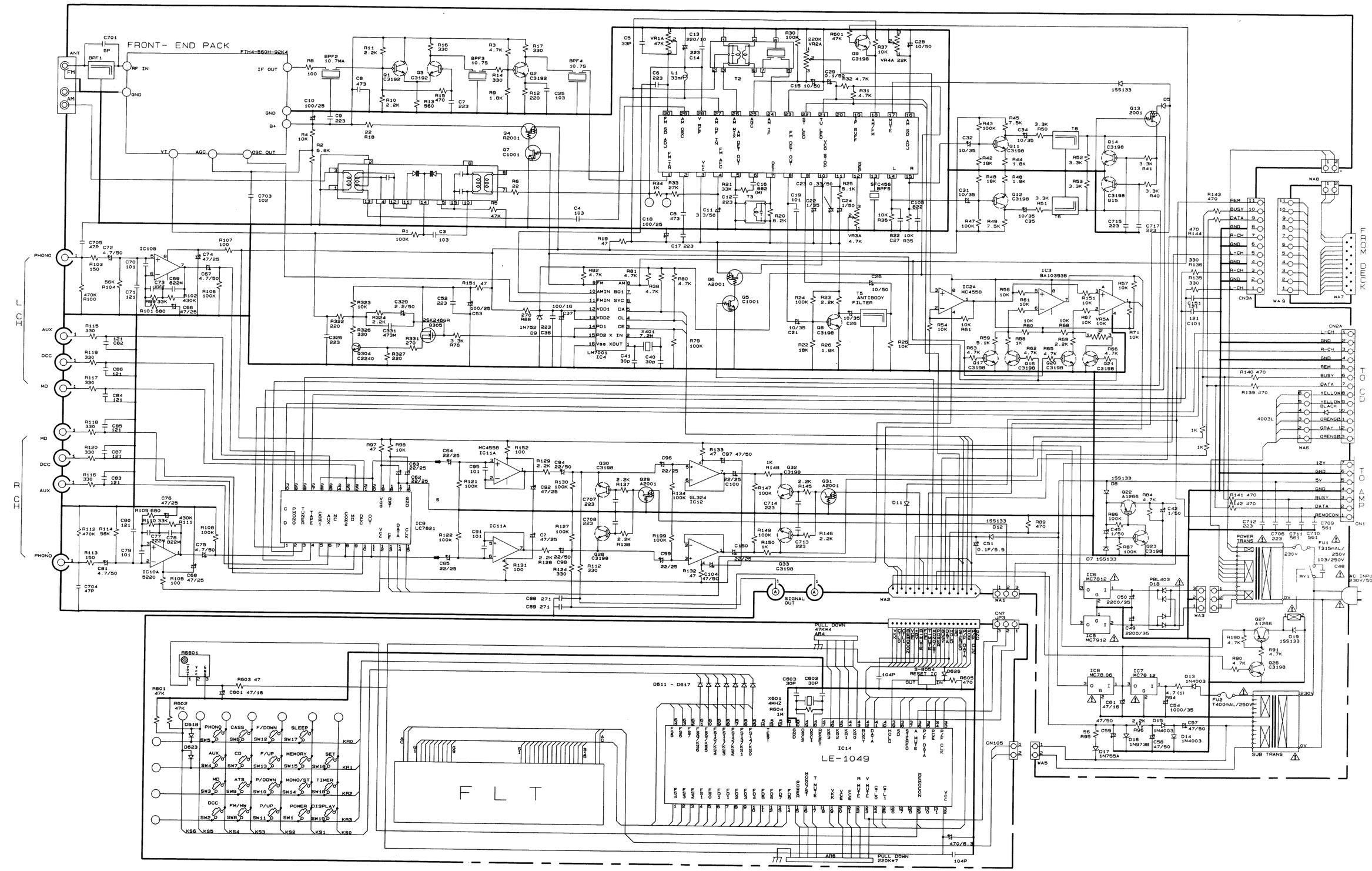
IC 1	PIN NO.	1	2	3	4	5	6	7	8	9	10
LA1851N	(FM) VOLT(V)	2.3	2.3	11.3	1.8	0	2.3	11.5	3.77	2.35	9.78
	(MW)	2.5	2.5	11.3	2.5	2.3	2.3	11.3	2.5	2.3	9.8
	PIN NO.	11	12	13	14	15	16	17	18	19	20
	(FM) VOLT(V)	9.8	0.3	9.57	5.74	5.58	1.6	0	4	0.2	0.5
	(MW)	9.8	0.4	9.1	5.6	5.6	1.6	0	0	0.2	0.9
	PIN NO.	21	22	23	24	25	26	27	28	29	30
	(FM) VOLT(V)	0.7	1.2	0	2.3	1.5	11.3	2.5	2.5	2.5	1.3
	(MW)	0	4.2	0	2.6	1.9	11.3	2.5	2.5	2.5	0.9
IC 2	PIN NO.	1	2	3	4	5	6	7	8		
KIA4558	(FM) VOLT(V)	1.7	0.6	0.6	- 13	0	0.8	4	4.5		
	(MW)	1.4	0.5	0.5	13.1	0.8	0.8	4.5	5		
IC 3	PIN NO.	1	2	3	4	5	6	7	8		
BA10393	(FM) VOLT(V)	4.5	0.8	1.2	0	1.2	1.4	0	4.5		
	(MW)	4.1	1.1	1.4	0	1.3	1.3	4.2	5		
IC 4	PIN NO.	1	2	3	4	5	6	7	8	9	10
LM7001	(FM) VOLT(V)	1.3	1.7	0	0	0	0	0	1.6	0	0
	(MW)	1.4	1.8	0	0	0	0	0	0	1.8	1.9
	PIN NO.	11	12	13	14	15	16				
	(FM) VOLT(V)	2.9	4.5	4.5	1.8	1.8	0				
	(MW)	0	5	5	0	1.8	0				
IC 5	PIN NO.	1	2	3							
MC7912	VOLT(V)	0	- 25	- 13							
IC 6	PIN NO.	1	2	3							
MC7812	VOLT(V)	23	0	13							
IC 7	PIN NO.	1	2	3							
MC7812	VOLT(V)	18	0	13							
IC 8	PIN NO.	1	2	3							
MC7806	VOLT(V)	12.9	0	6.5							

IC 9	PIN NO.	1	2	3	4	5	6	7	8	9	10
LC7821	VOLT(V)	0	0	0	0	0	0	0	0	0	0
	PIN NO.	11	12	13	14	15	16	17	18	19	20
	VOLT(V)	0	- 13	0	0	0	0	0	12.9	12.9	0
	PIN NO.	21	22	23	24	25	26	27	28	29	30
	VOLT(V)	0	0	0	0	0	0	0	0	0	0
IC 10	PIN NO.	1	2	3	4	5	6	7	8		
M5220P	VOLT(V)	-0.3	0	0	-12.7	0	0	-0.4	12.5		
IC 11	PIN NO.	1	2	3	4	5	6	7	8		
KIA4558	VOLT(V)	0	0	0	-12.7	0	0	0	12.5		
IC 12	PIN NO.	1	2	3	4	5	6	7	8	9	10
GL324	VOLT(V)	0	0	0	12.5	0	0	0	0	0	0
	PIN NO.	11	12	13	14						
	VOLT(V)	- 13	0	0	0						
IC 14	PIN NO.	1	2	3	4	5	6	7	8	9	10
LE-1049	(FM) VOLT(V)	- 30	- 26	- 28	-26.1	-28.4	-33.7	-33.7	-33.7	-33.7	-33.7
	(MW)	- 23	- 23	- 23	- 23	- 23	- 33	- 33	- 33	- 33	- 33
	PIN NO.	11	12	13	14	15	16	17	18	19	20
	(FM) VOLT(V)	-33.7	-33.5	-33.6	-33.7	5	5	0	0	-35.5	0
	(MW)	- 33	- 33	- 33	- 33	5	0	0	0	- 35	0
	PIN NO.	21	22	23	24	25	26	27	28	29	30
	(FM) VOLT(V)	0	5	0	5	0	5	5	0	5	0
	(MW)	0	5	0	5	5	5	5	5	5	0
	PIN NO.	31	32	33	34	35	36	37	38	39	40
	(FM) VOLT(V)	0	5	0	0	0	0	0	0	5	0
	(MW)	0	5	0	0	0	0	5	0	5	0
	PIN NO.	41	42	43	44	45	46	47	48	49	50
	(FM) VOLT(V)	5	5	0	0	0	0	0	0	1.58	0
	(MW)	5	5	0	0	0	0	0	1.6	1.6	0
	PIN NO.	51	52	53	54	55	56	57	58	59	60
	(FM) VOLT(V)	0	5	5	0	-34.2	-34.2	-29.6	-29.6	- 27	-32.3
	(MW)	0	5	5	0	- 34	- 34	-29.7	-25.1	-27.4	-32.5
	PIN NO.	61	62	63	64						
	(FM) VOLT(V)	-27.8	- 30	-25.6	- 21						
	(MW)	- 30	- 30	- 28	- 21						

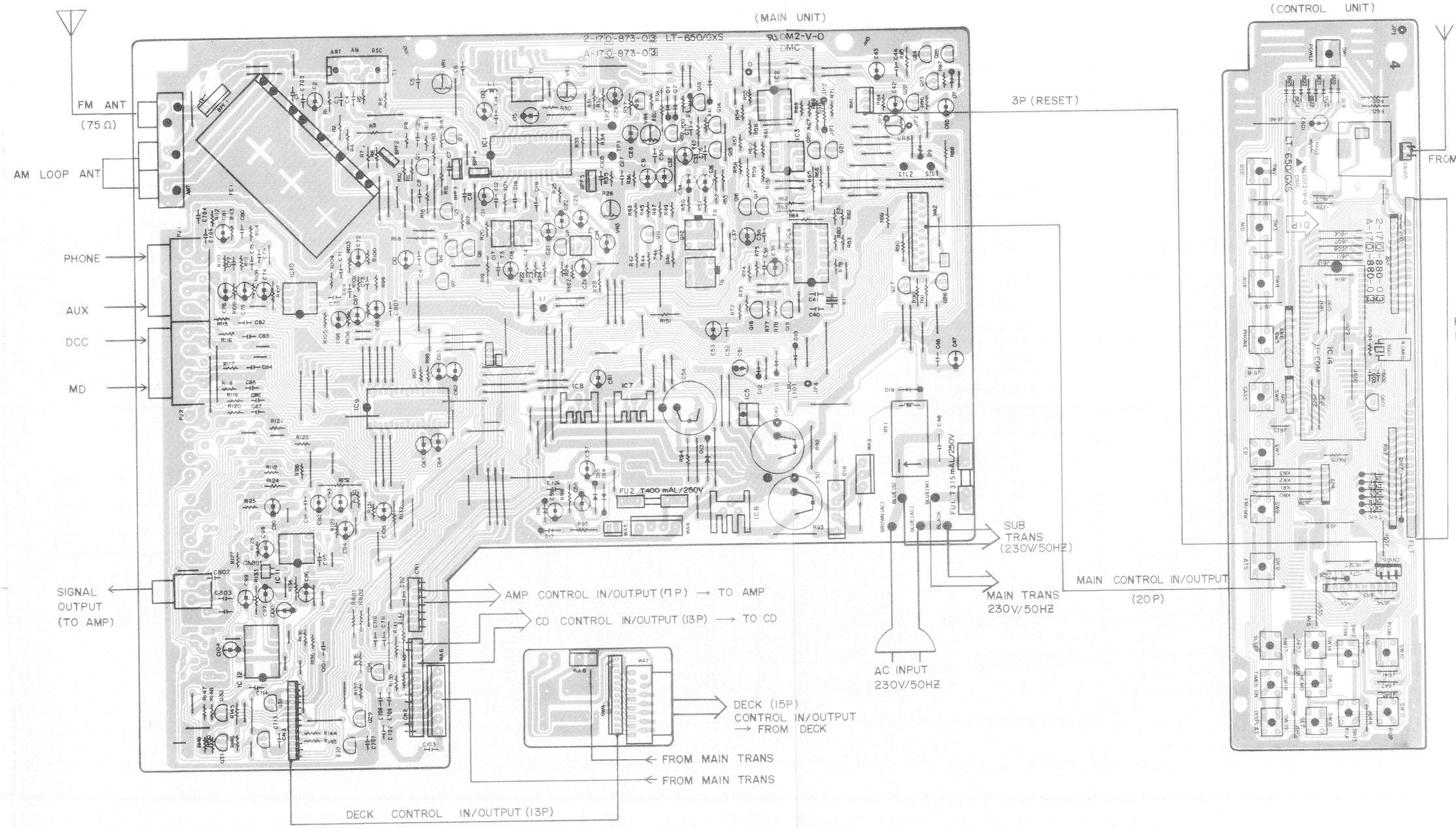
BLOCK DIAGRAM > FD7312



SCHEMATIC DIAGRAM > FD7312



WIRING DIAGRAM > FD7312



BLOCK DIAGRAM > FD7312

IC14
LE-1049 MICRO-PROCESSOR